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THE INDEPENDENT GUIDE TO PERSONAL COMPUTING VOL. 17 NO. 6 MARCH 24, 1998

UTILITY

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GUIDE

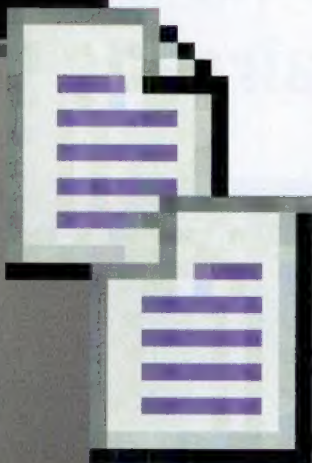
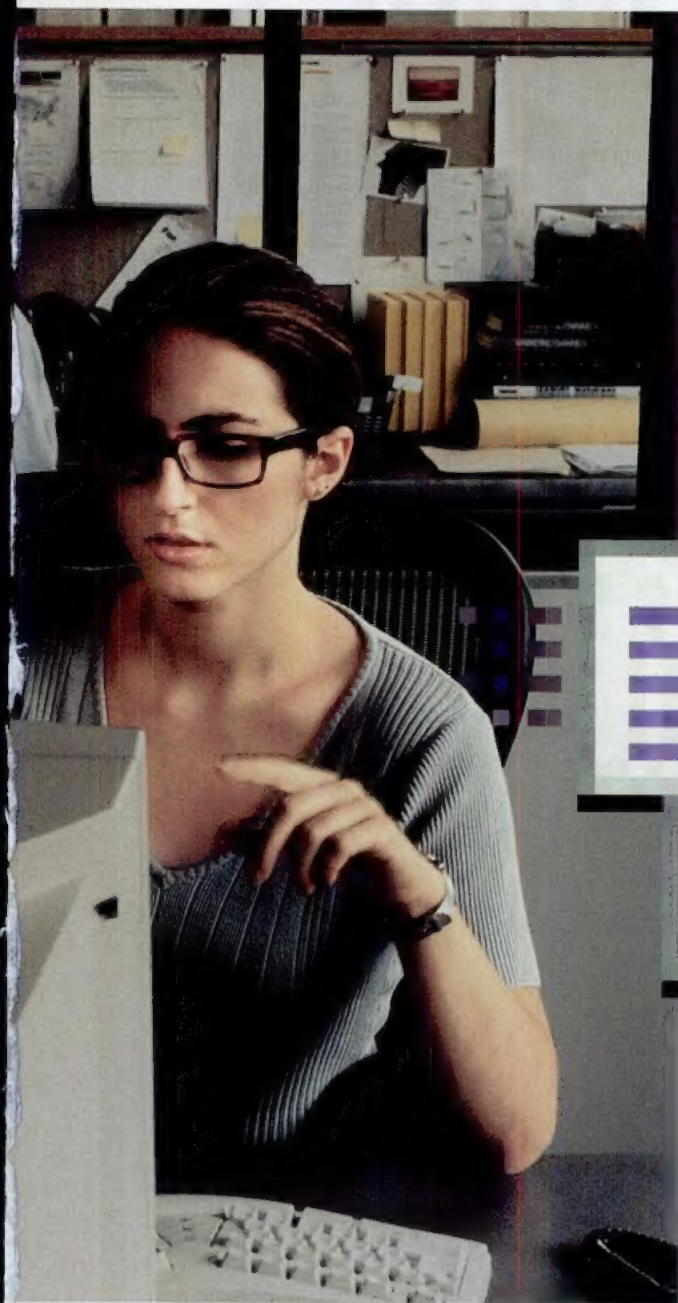
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Necessity, Mother of Utility



PCs just don't work as well as they should. You know it and I know it. Microsoft, Intel, Apple, and every other company in the PC industry knows it. Hard disks aren't perfect, and when they crash, your

data can get lost forever. Put a strange floppy disk in your system or download something from the Internet and you

could get a virus. The computer doesn't always keep track of all the things you do. Nor does a computer track all the sites you visit on the Web, or all the sites you don't want your kids to visit.

Under Windows, in particular, you can install a new program and occasionally discover that another program doesn't work. Try to uninstall the program and parts of it may well remain.

For these reasons and others, we turn to software utilities—programs that make our lives easier. In this issue, you'll find reviews of more than 200 of these little gems.

I'm a big fan of utilities, because they do a lot of the little things that make computing easier. I use various utilities to compress and uncompress files, to check for viruses, to maintain my hard disk, to uninstall software, and a whole lot more. My guess is that you run utilities as well.

At *PC Magazine*, we commission original utilities for every issue, both to show readers how such utilities work and to fill in some gaps. For instance, one of my favorite *PC Magazine* utilities is SyncURLs, which synchronizes bookmark lists among different browsers on different systems. In this issue, we feature Scroller, a program that lets you read online documents easier, on page 259. (For a complete list of *PC Magazine* utilities, check www.pcmag.com/downloads.)

And that's great—when the utilities work. But sometimes, even a great utility can't make up for failures in the application or the operating system.

For example, the other day I ran into one particular file that crashed a database program every time I tried to print. The file had printed with no trouble earlier. The database company's technical-support represen-

tative told me to uninstall the printer and try again, but that didn't work. I then uninstalled and reinstalled the database multiple times. Still no change. I had installed some new programs earlier, so I tried removing them. I tried some of our favorite uninstall utilities, crash protection software, and antivirus utilities. Nothing.

I finally ended up bringing the file to the office, where I was able to print it. This solved my immediate problem. Later, I tried Network Associates' Nuts & Bolts, which seemed to fix the problem. What would the average user do? Pay a lot for technical support, I'm afraid. (The vendor—Apple Computer's Claris Corp., now Filemaker Corp.—said it charges for support if you call more than once.) And I still haven't figured out what went wrong in the first place. I suspect it may have to do with a printer utility I had tried, but I'm not sure.

That's part of what makes computing so frustrating. I have enough resources and software that I can usually solve a problem. But I shouldn't have to go through all this. Neither should you. And what about the less-sophisticated user, the one who probably doesn't even know where to turn?

As of yet no one has solved the basic issue of making computers completely reliable when you install new software and hardware—not Microsoft, not Apple, not IBM, not even the vendors of the various flavors of Unix. Java may have the most promise in this area, but it's certainly not there yet; in most cases, Java doesn't even print.

It's good that utilities address some of these problems. But it would be better if the software just worked as intended.

Don't get me wrong—I love utilities when they give me the ability to do things I can't do with standard software. But it would be nice not to need them.


MICHAEL J. MILLER

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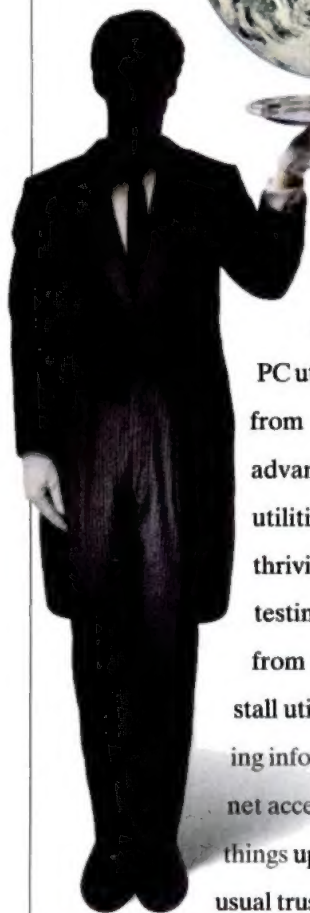


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THE 1998 UTILIT



BY JOHN MORRIS

Welcome once again as we serve up *PC Magazine's* annual PC utilities smorgasbord. This year, far from dwindling in the face of new, advanced operating systems, the PC utilities market is alive and well, even thriving. And again this year, our Labs testing and reviews run the gamut—from diagnostics, antivirus, and uninstall utilities to Internet utilities for finding information faster and filtering Internet access. Some new players are spicing things up, but you'll find your share of the usual trustworthy suspects100

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Utilities Forever

Don't forget that all of *PC Magazine's* utilities, including this issue's offering, *Scroller*, are always available free directly from our Web site.

Head straight for www.pcmag.com/download and find some new favorites. Not sure which utilities you want to try? Check out our list of Top Ten All-Time Favorites.

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NET TOOLS

Surviving Network Disaster

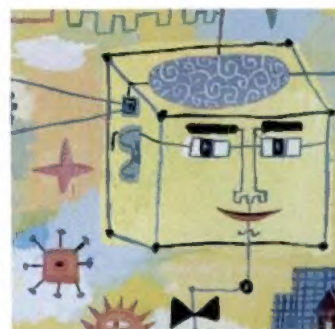
BY STEVE RIGNEY

Long a staple in the network manager's toolbox, a network backup product looks out for you in many ways. These packages—more robust and extensive than desktop backup utilities—work with both NetWare and Windows NT227



PC TECH

Windows NT Option Pack



BY KEITH PLEAS

Falling somewhere between a familiar Service Pack release and a full-version upgrade, this Option Pack carries both updates to Windows NT services and some new components, including several enterprise- and Internet-related additions. Microsoft says everything in the Option Pack is now officially part of the OS.....249

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BY JENNIFER TRIVERIO

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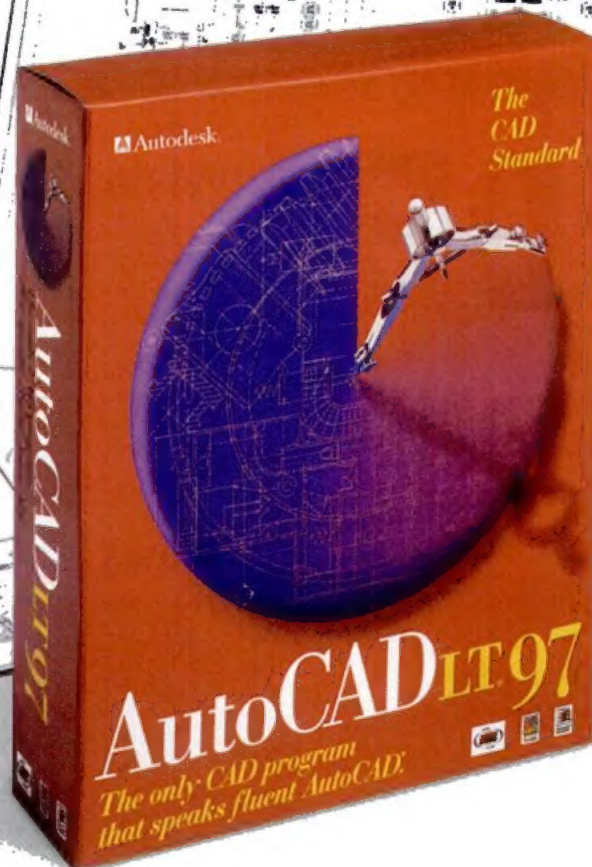
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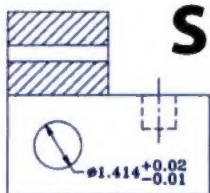


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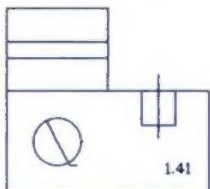
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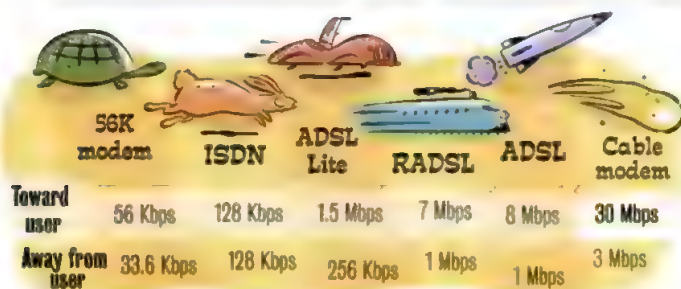
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A Faster Web for All

Computer makers and phone companies are joining together to bring superfast Web access to homes and businesses over existing telephone lines. Known as Universal ADSL or ADSL Lite, the technology is getting unprecedented support from some of the biggest players in the PC, networking, and telecommunications industries.

Digital subscriber line (DSL) technology, developed in the 1980s to deliver video-on-demand over phone lines, offers superfast Internet access—up to 160 times as fast as with 56-Kbps modems. Asymmetrical DSL, so called because it offers a faster connection to your desktop (downstream) than from your desktop (upstream), is considered to be the most viable version of DSL because it works over long distances.

Recently, Compaq, Microsoft, and several regional Bell operating companies formalized their support for ADSL and plan to develop ADSL Lite, which will require little effort beyond plugging in an ADSL modem and calling your Internet access provider.

An ADSL hookup today requires a technician to visit your home or business to install a signal splitter to divide a single copper telephone line in two—one line for data services and one for phone services. A “splitterless” solution is currently under development.

Although ADSL Lite is slower than its full-speed progenitor, it's roughly 25 to 35 times as fast as today's fastest conventional modems. If all goes as planned, faster Internet connections will soon be as easy to get as telephone service.

The Sharper Web Image

You're browsing through your favorite online clothing store and happen upon what looks like a handsome tie. Click. It's yours. The merchandise arrives at your doorstep, but to your dismay, it turns out to be a hideous insult to your neckline. Back it goes to the online store.

Merchandise returns are plaguing online stores, but a solution could be here. Live Picture Image Server, launched in February, stores and renders super-high-resolution images and blasts them down to browsing



customers on request.

Based on technology that Live Picture calls Universal Viewing, the software lets shoppers quickly zoom in and examine merchandise in detail. And here's the key: It does so without an annoying browser plug-in. “Plug-ins are death,” says John Ison, vice president of marketing at Live Picture.

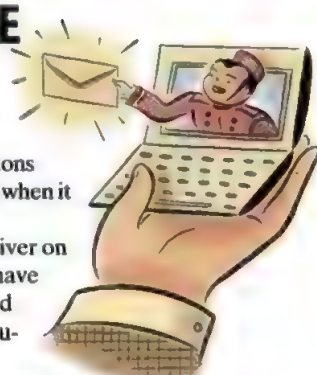
Paging Windows CE

If you're like most owners of Windows CE-based hand-held computers, you're probably clamoring for paging and other wireless communications capabilities, which Microsoft promised when it introduced the operating system.

Now it looks as if Microsoft will deliver on its promise. Microsoft and Motorola have agreed to develop Windows CE-based mobile technology for wireless communications in specified service areas.

Motorola will provide wireless connectivity for Windows CE devices using one-way paging services over its FLEX networks. The two companies will collaborate in developing a software protocol to let such devices receive data over one-way and, eventually, two-way paging networks.

Motorola will also manufacture a set of wireless hardware modules for Windows CE devices that provide paging capabilities. The first products should be available in mid-1998.



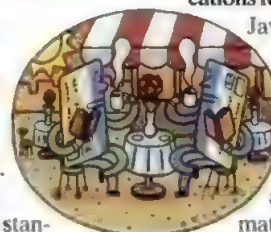
Smart Cards Go Java

Java isn't just for network computers and information appliances. An effort is under way to make it the standard for smart cards (plastic cards with embedded computer chips) that store money.

Sun Microsystems' division JavaSoft has developed the Java Card specification, which provides smart-card vendors with a

uniform way to build Java applications for the cards. With a Java card, you'll be able to download cash from ATM-like machines, access the Internet through network computers in hotels and airports, use automated airline ticketing, and track frequent-flyer miles.

Some smart cards may soon have embedded microprocessors designed specifically to run Java. In fact, Sun is working with Siemens Semiconductors and Visa to develop such a chip by midyear.



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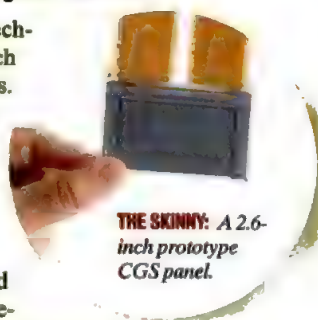
Paper-Thin Computers

Liquid-crystal display (LCD) technology could soon lead to much more than just flat-panel displays. Sharp and Semiconductor Energy Laboratory, both based in Japan, have developed a technology that promises to make the bulky personal computer a thing of the past.

Through a new technique called continuous-grain silicon (CGS), researchers can now build what they call a system-on-panel or a paper-thin computer. The device is essentially a piece of glass that combines a thin-film transistor (TFT) LCD and digital data processing circuits. CGS technology could lead to a variety of compact computing gadgets, such as ultrathin LCD "books," super-compact personal information devices, and giant, ultra-high-resolution LCD panels.

High-performance silicon is key to the development of such devices. In continuous-grain silicon, electrons travel 600 times as fast as they do in the silicon in TFT displays, which results in electrical conductivity that's fast enough for computing devices such as memories and CPUs.

Sharp has big plans for CGS. The company contends that CGS technology will "create a new semiconductor industry that rivals the present industry." Already, Sharp has used CGS to build two prototypes: a high-definition, TV-compatible LCD TFT panel and a 60-inch LCD TFT rear projector.



THE SKINNY: A 2.6-inch prototype CGS panel.

Merced: Sun Won't Bite

As Intel ramps up for next year's release of the IA-64 chip Merced, the company is gaining support from important backers in the workstation arena, with one notable holdout: Sun Microsystems. Although Sun has made a commitment to porting its operating system Solaris to the 64-bit Merced platform, the company has decided to eschew Merced in its hardware efforts.

The company has confirmed that it won't produce workstations based on Intel's Merced but will instead continue to use its Sparc RISC processors. Furthermore, Sun maintains that it will never make Intel chips the basis of its



workstation platforms—as many other workstation players have done. Sun has also said it will stay tied to Unix operating-system platforms and will not move to Microsoft Windows NT within its workstations.

Sun CEO Scott McNealy has said that Sun workstations running Solaris constitute "one of the few significant platforms left to compete with Wintel."

THIS ISSUE'S CONTRIBUTORS: Angela Hickman, Carol Levin, Sebastian Rupley, and Don Willmott.

High-Tech Salary Surge

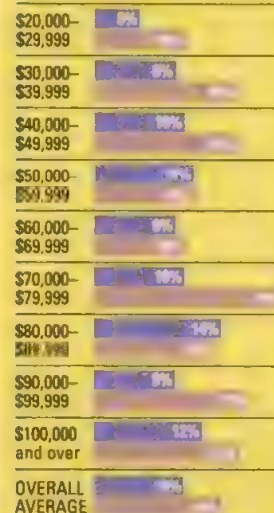
U.S. universities are turning out fewer graduates in high-tech fields every year. That's bad news for employers, which are reporting a shortage of qualified candidates. But it's turning out to be good news for systems managers, whose 1997 salary increases surged to 14 percent, up from 10 percent in 1996.

The numbers are based on the CIO Institute's recent survey of close to 1,600 system and security administrators responsible for the care and feeding of electronic commerce systems, Web servers, and enterprise systems.

Other findings: Salaries in New York, Boston, San Francisco, and San Jose are the highest,

Skilled systems managers are commanding healthy salary increases.

Salary increase from 1995 to 1996
Salary increase from 1996 to 1997



Source: The CIO Institute

but salaries are surging all across the U.S., Canada, Europe, and Asia. The highest percentage of those surveyed (22 percent) reported salaries of from \$50,000 to \$59,999. The average reported salary was \$57,346. The greatest salary increase (almost 30 percent) was for employees earning \$70,000 to \$79,999, reflecting employers' fears that senior employees are more difficult to replace if they're lost.

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Source: Computer Intelligence Infoheads, December 1997.

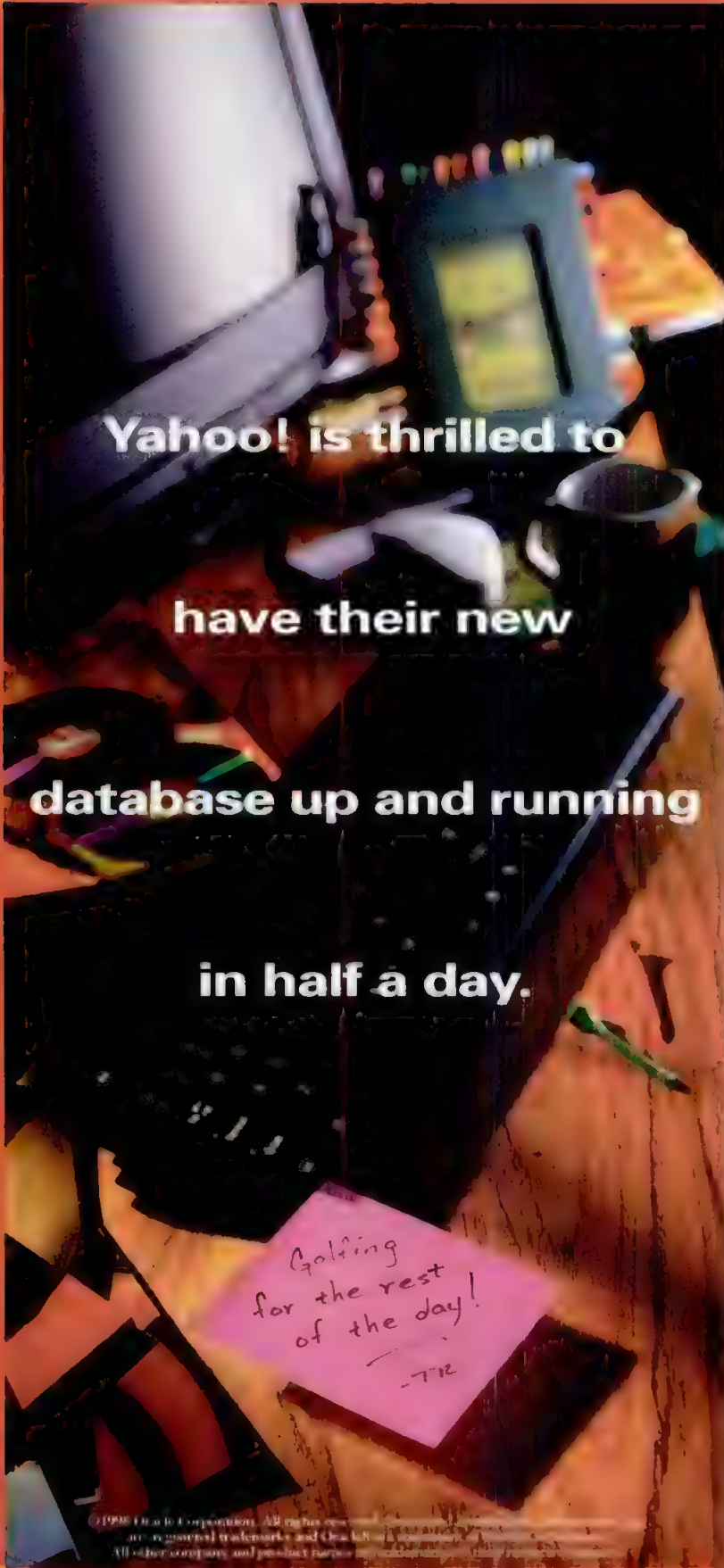
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Source: International Data Corp., 1997



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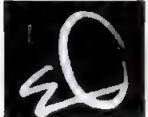
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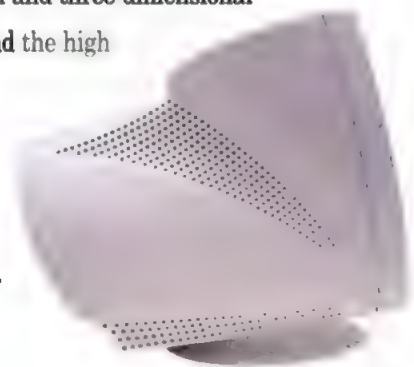
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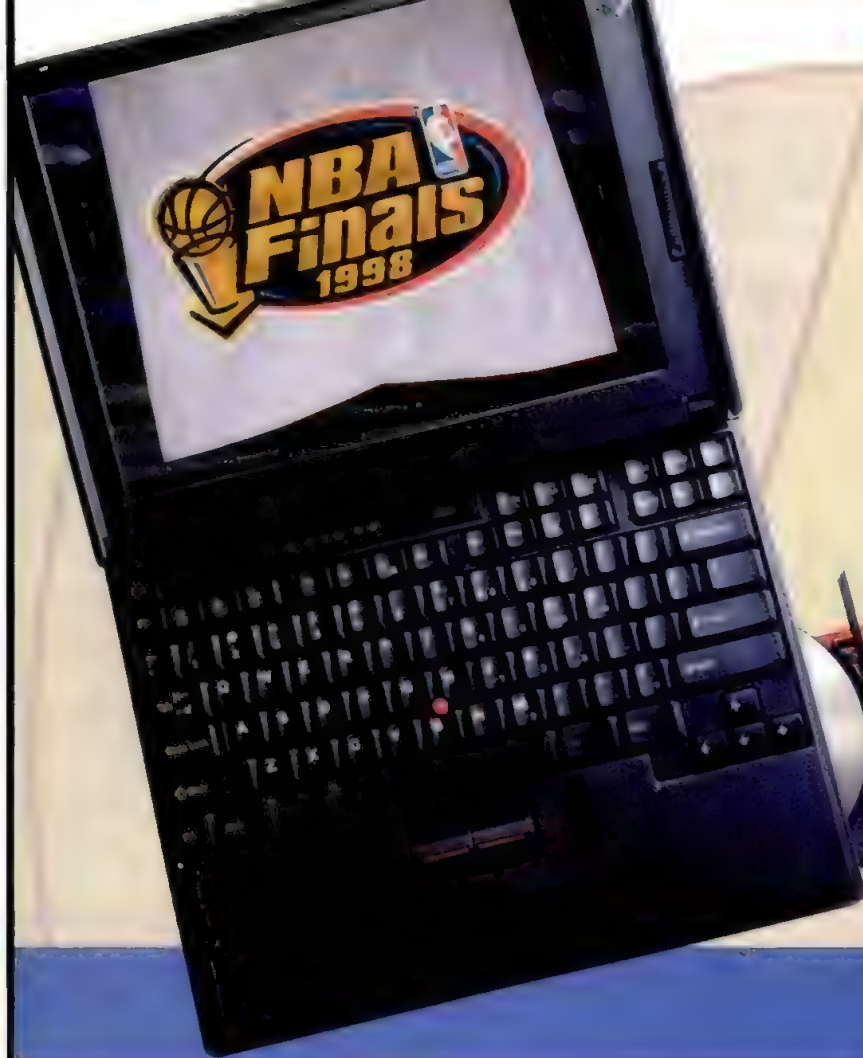
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Solutions for a small planet

Letters

IRQed

Jim Seymour's column "The New IRQ Scandal" (January 20, 1998) brought back some bad memories for me. In the earlier days of the PCI bus, when Windows 95 was still in beta, it seemed that system manufacturers and Microsoft had at least partially solved the IRQ problem. PCI devices were allowed to share IRQs. In fact, many system BIOSes insisted on it by allocating only a single IRQ to the PCI bus, to be shared by all devices. When the interrupt was received by the OS, each installed interrupt handler would be called and given a chance to query its device to see if that was the one that generated the interrupt. Somewhere along the way—I'm not sure where or why—this feature disappeared. Plug and Play BIOSes now assign individual IRQs to all PCI devices. I can only guess that resistance to shared IRQs was generated by hardware add-on manufacturers who didn't want to make their interrupt handlers compliant.

GREGG SPAULDING
via the Internet

Seymour provided a great service with his latest column. In looking for a new machine, I and many others would be concerned only about bays and slots and would never think of available IRQs.

BOB GUIRY
via the Internet

I always enjoy an instance of the computer press attempting to bite the hand that feeds it, but I thought that Seymour missed the bus completely. Rather than criticizing system assemblers for shipping machines with no available IRQs, he should be blasting the CPU, chip set, motherboard, and operating-system designers who continue to crank out 20-year-old designs. Computer assemblers are stuck with the same problem I have every time I build a system from scratch. You simply can't equip a multimedia production system with just 16 IRQs—and you shouldn't have to. PCI Plug and Play was supposed to relieve the confusion about IRQ and memory I/O assignments, but it did nothing to increase the total number of resources that system assemblers can use.

GARY L. GEHMAN
via the Internet

Seymour said he has known about the IRQ limitations of some computers for about a year, and yet your product reviews totally ignore this criterion when evaluating computers. How is it possible for "experts" to ignore such an important cause of potential problems? I have been programming for over 33 years, and for a long time I thought PCs were toys and totally ignored them. But before I bought one, I read



*"I hope that Seymour takes
the IRQ issue personally and
becomes a spokesperson."*

about them for six months and finally settled on a Micron. I based the decision on your performance tests and reviews. I am disappointed to find that your evaluations, which I always read, are not as thorough as I once thought.

KEN HUNDZINSKI
via the Internet

Until I read this, I thought I was alone in the fruitless experience of trying to ascertain IRQ usage in advance of buying my new computer. I too found a lack of understanding of my questions. In the end, I realized that my new PC, regardless of whom I bought it from, would be maxed out.

STEVE DRAKE
via the Internet

Unfortunately, hobbyists like me don't have the kind of options available to Seymour—like swapping out video and audio systems—but just the same it was refreshing to see that even experts can be stymied.

SALVATORE J. FERRANTE
via the Internet

I can only hope that Seymour takes this issue personally and becomes the spokesperson for the little guy.

MICHAEL BERNASIEWICZ
via the Internet

THE WEBMASTERS SPEAK OUT

"PC Magazine's Guide to Web Site Design" (January 20, 1998) offered some great tips. There is one thing I'd like to add, though: Every page needs to have a link to the site's home page. Nothing is more annoying than

having to go back seven or eight pages to get to the home page.

JASON CLISHE
via the Internet

It's way too early to be touting Dynamic HTML, Cascading Style Sheets, and 4.0-browser HTML tags. The access statistics for my Web site show that only 29 percent of my visitors are using Version 4.0 browsers. And as you mentioned, there are many incompatibilities between Microsoft's and Netscape's implementations of these advanced features. If you're still not convinced, consider this: "PC Magazine's Guide to Web Site Design" urges Webmasters to support nonframes browsers—and frames have been around since Version 2.

BLAKE WILFONG
Houston, Texas

I've seen many articles on Web page design, but almost nothing on hosting—either on choosing a host or on posting these super Web pages you've taught us how to design. The cart is worthless without the mule.

MARK A. MILLS
Germantown, Tennessee

Your "Web Authoring Tools" roundup (January 20) seems to have perpetuated PC Magazine's policy of reviewing software without so much as a word addressing tech support. Normally your comparison tables at least note each vendor's policy. I can't think of a more important software feature when it comes to our employees getting value for what I buy. I guess tech support is not as important to your wizard reviewers as it is to your readers. I returned your Editors' Choice (Microsoft FrontPage 98) after learning of Microsoft's approach to tech support firsthand. Would it be asking a lot to have your reviewers pick up the phone and ask tech support a "dumb" question?

PETER SHIKLI
San Clemente, California

I think it diminishes the credibility of your reviews to give an Editors' Choice to a Web authoring tool that writes advanced code that works only for a minority browser.

JOHN LEDERER
Oregon, Wisconsin

Articles like "Web Authoring Tools" keep me in business as a system integrator. I have been using FrontPage for over a year and am currently using FrontPage 98. Many of the features your article touts do not work when published to servers that do not have the FrontPage 98 extensions installed. Although I understand that the article is about the user

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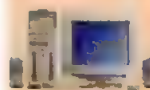
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Letters

interface versus the FrontPage server extensions, the client and server extensions come as a package. Both sides have to be installed and working properly for the features to work. Further, many features do not work with any Netscape browser—something you should have noted. This is also barely mentioned in the Microsoft documentation, except for the words “This may not work on all browsers.”

ERIC VEY
via the Internet

In this review and in our December 16, 1997, First Looks review of FrontPage 98 (“Great Sites by Design”), we made it clear that not all FrontPage 98 features work in Netscape. This, however, is a minor point that applies equally to all other editors out there. FrontPage does nothing that keeps content from appearing in Netscape—it may not be animated, but it will be there—and that makes FrontPage no different from any other editor that supports the IE extensions. As for the server extensions, we made them work locally, and we’ve seen them working on dozens of sites.—Ed.

SIMPLE AND COMPACT

Bill Howard was completely right in his column “The Flashing 12 Syndrome” (January 20, 1998). As a small-business owner with limited space, I love all-in-one computers such as the Compaq Presario 5528, which is perfect in size and function. When a computer move is necessary you just pick it up and move it—no wires, monitors, speakers, or other junk to drop. Unfortunately, the fastest one is 75 MHz. I’d like some computer companies to take a trip to a small business and see what products are needed. Otherwise, their fantas-

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CORRECTIONS AND AMPLIFICATIONS

In our January 20, 1998, cover story (“High-End Notebooks”), the Summary of Features table listed the price of the AST Ascentia M 5230T as \$4,499 direct. It should have been \$4,500 street. The price in the review itself was correctly stated, however. And in the review of the PowerTrip 233, the toll-free number for Power Computing Corp. should have read 800-527-0642.

In the January 20 Pipeline story “Hand-Held Voice Mail” (page 10), we incorrectly stated that IBM and Panasonic recently introduced a portable digital voice recorder. In fact, IBM and Olympus introduced the product, the Olympus D1000.

tic new products will continue to flash 12:00, just like the VCR in my own home.

BILL WYCKOFF
Altamont, Kansas

I disagree with Howard’s opinion that Windows has always lacked simplicity, and I totally disagree when he says that about Windows 3.1x, which is by far the least complex of all Windows environments and can easily be considered simple. In Windows 95 and Windows NT, there is a perfect balance of complexity and simplicity.

SCOTT SWINDELLS
via the Internet

FORGOTTEN: LOW-END ROAD WARRIORS

Although I applaud the efforts of computer makers to market notebooks that rival the fastest desktop units (“High-End Notebooks,” January 20, 1998), I am disappointed that the low end has been forgotten. Many users do not want all the bells and whistles that are now standard on notebooks. More important, we don’t want the \$3,000-plus price tag that comes with these features. Many users are students or professionals on very limited budgets who need notebook computers as satellites, not as replacements for their desktop systems. We need systems with adequate power and memory to run mainstream applications, but we could live without many of the features that have driven the cost of notebooks through the roof.

STEVEN FRIEDMAN
Parker, Colorado

THE PLAIN OLD INTERNET

In “The Talk of the Internet” (January 20, 1998), John C. Dvorak asserts that “IP telephony makes voice switches an anachronism.” I agree that POTS is on its way to oblivion, but to suggest that phone company profits will decline and that the phone companies are “clueless about this entire movement” is absurd. Do you think that the phone companies and long-distance carriers are going to supply bandwidth for free? You can be sure that we’ll pay. Also, just because we don’t have a 1.5-Mbps connection to every home in America available right now doesn’t mean that the phone companies are clueless. The POTCs (plain old telephone companies) are the ones with the largest installed infra-

structure, and they are committed to delivering high-speed data to your doorstep.

JOHN W. HILE
Lake Orion, Michigan

GET A LITTLE CLOSER—OR FURTHER

In “How Close Can You Get?” (January 6, 1998), Bill Machrone did a good job of describing the macro capabilities of good digital cameras. But macro is only one capability. Since the seminal work of Ellis Betinsky in the design of the Series I lenses for Vivitar, macro capability with wide zoom range is a trivial problem for any capable designer and producer. So today, even cheap cameras can focus close. The real problem with digital cameras, as well as home video cameras, is the inability to encompass a wide-angle view because the photosensitive element in a digital camera is so small. It is currently very expensive to produce reasonable-quality lens elements for focal lengths of a few millimeters. Until that is solved, the problem will be not how close we can get but how far we have to back up to get everybody in the picture.

BERNARD W. JOSEPH
via the Internet

PRIVACY IS THE KEY

I hate the idea of key escrows and the idea of anyone else being able to access my data, even if it’s simply e-mail (Bill Machrone, “Key Escrow: Bad Idea, Bad Law,” January 20). I also have a problem when people run around ranting about “corporate records” and “corporate messages” and disregard the most important records of all. I’m speaking, of course, about being able to read the files of the oft-ignored majority of private citizens.

FABRICIO CERIONI
Pasadena, California

As Machrone mentioned in his recent column, criminals could easily get around the law by using an unbreakable “one-time pad” to encrypt a message. What he didn’t mention is that the encrypted message could be hidden in an innocuous picture or sound file. Unless members of the government had a copy of the original, unaltered multimedia file, they could never even detect that there was a message embedded in it, let alone extract and decode it.

JEFF BANGLE
Arlington, Virginia

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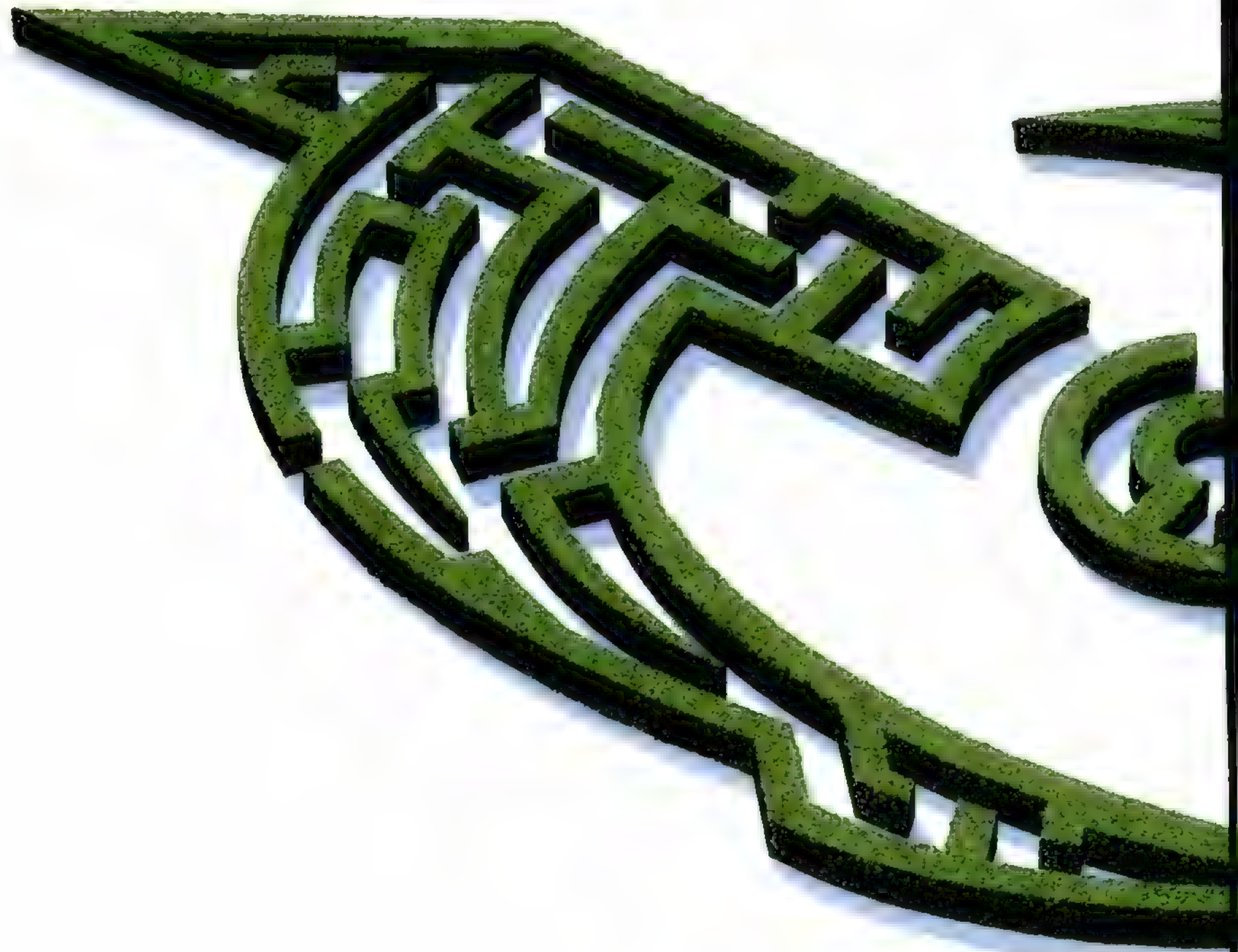


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Trends

Home Base

The PC as family butler.

George Jetson would be impressed. PC technologies designed to coordinate and manage family information, communication, and entertainment as well as home appliances, lighting, heating, and security are gaining momentum this year. Some of the largest industry players, including Intel, Microsoft, and Sun Microsystems, as well as some newcomers, such as Intelogis and ShareWave, are making headway in developing standards, tools, reference designs, and gadgets for turning your home PC into your home control system.

Intel's Connected Home architecture relies on a no-new-wires approach. Instead, multiple networking schemes—infrared, radio frequency, AC power lines, telephone wires, and television cable—will all coexist. (See Bill Howard's column "The Wired Home" in this issue for more on home networking.) Intel Architecture Labs is currently working on customizing PCs for the living room, kitchen, home office, and kids' rooms. Researchers have developed new classes of flat-panel displays including sofa pads, fridge pads, and alarm pads, as well as smart telephones with displays that change to meet the task at hand, whether it's entertainment, home control, or plain old phone calls.



Meanwhile, IBM engineers are planning a home of the future that calls for a server in the basement for controlling a home intranet as well as wireless radio-frequency devices that tie together entertainment, networking, and appliances. As a first step in commercializing its concepts for home automation, IBM has introduced its Home Director software, which controls lights and appliances via radio frequency.

ShareWave is a newcomer funded by Microsoft co-founder Paul Allen's Vulcan Ventures and Microsoft; Softbank

(the parent company of Ziff-Davis, PC Magazine's publisher) is also an investor. ShareWave has raised more than \$7.5 million to develop its vision of a wireless home network. The first products are expected to appear in April. ShareWave will design, produce, and sell consumer electronics devices and license the technology to what the company hopes will be a raft of "ShareWave-enabled" devices from other manufacturers.

Intelogis, a spinoff from Novell, has developed a wireless home PC networking technology called Passport. Recently launched, Passport uses existing AC circuitry, but its signal is too strong to coexist with X-10 devices. (X-10 technology, available since 1978, uses wireless radio-frequency modules to control appliances. Modules plugged into power outlets send pulses over AC wiring to receivers that can, for example, switch off the garden sprinkler or turn on the coffee maker.) Since the X-10 signal could transmit to neighbors, Passport has three levels of encryption. The strong signal does, however, offer the benefit of letting you share files and play games wirelessly with neighbors.

In another spin on home networking, Data General recently demonstrated its Network Utility Box (NUB), which will connect up to eight PCs—and eventually other information appliances—via spread-spectrum wireless networking technology and communicate with your ISP via analog, ISDN, xDSL, or cable. It's slated for release in the fourth quarter.

Also this year, home PCs from major manufacturers will likely be bundled with Home Automated Living's HAL, which uses X-10 technology for controlling appliances. This spring, the company plans to release a version that sends signals via home wiring using the Consumer Electronics Bus (CEBus) standard. Ten years in the making, CEBus has recently been approved by major electronics manufacturers as a way for appliances and electronics to share information.—Bruce Brown

This New House

Several products to connect and control the home are slated for delivery this year.

The player	The product and strategy	The place
Data General	Network Utility Box will wirelessly connect up to eight PCs—and eventually other info appliances—and communicate with your ISP. Available in 4Q '98.	www.dg.com
Home Automated Living	HAL2000 uses X-10 wireless modules to control lights, appliances, heating, cooling, and security systems. A CEBus version will be available in the spring.	www.automatedliving.com
IBM	Home Director uses wireless modules to control appliances. IBM Research is developing a digital home with a Family Information Center and wireless info appliances.	www.ibm.com
Intel	The Anywhere in the Home initiative calls for the PC to serve as the hub for home management apps and devices, including fridge pads, sofa pads, and alarm pads.	www.intel.com
Intelogis	Passport networking devices use existing AC power lines to connect computers, devices, plugging into power outlets and attach to components over parallel cables.	www.intelogis.com
ShareWave	ShareWave-enabled digital appliances will connect a room to the home PC, which will serve as an "information furnace." First product slated for 3Q '98.	www.sharewave.com

Intruder-Attack Simulators

Plugging network security holes.

In their continuing race to stay one step ahead of potential intruders, network security managers are increasingly forced to think like the enemy. They're adopting more stringent methods to protect their networks, because the stakes of network failure/penetration are getting higher as more and more mission-critical applications are moving onto networks.

With public-domain products such as SATAN (System Administrator Tool for Analyzing Networks) making it easier to probe for well-known security holes, managers who haven't kept up with their peers are running greater risks of attack. SATAN is the best-known of a number of network security and monitoring tools that target Unix vulnerabilities. Other security tools include ipacl, logdaemon, portmap, and rpcbind; monitoring tools include Argus, Courtney, and Gabriel.

The latter two programs act as SATAN detectors, reflecting the fact that SATAN is used not only by network managers but also by potential intruders probing for vulnerabilities. You can download these and other programs from the Department of Energy's Computer Incident Advisory Capability (CIAC) site at ciac.llnl.gov/ciac/CIACHome.html.

In marked contrast to the numerous tools for Unix network security, only one DOS-based program—Karlbridge—is on CIAC's list. PC network managers looking for intruder-attack simulators may also want to check out a new offering from Netect, a developer based in Cambridge, Massachusetts, whose software development group is located in Israel. Netective is a commercial analog of SATAN that purports to be easier for non-security experts to use and more complete in its database of threats. The current version is designed for Solaris, with a Windows NT version due out shortly.

It may be not a moment too soon. With use of Windows NT surging in corporate America, in many cases displacing NetWare as a networking operating system, the importance of network security in Windows NT is growing fast.—Marc M. Groz



Utility Hits and Misses

PC MAGAZINE'S ANNUAL UTILITY GUIDE IS always a popular feature. We know that you're constantly looking for ways to make your system more secure, reliable, and efficient. Too often, though, utilities force you to sacrifice some speed and performance for these benefits.

Last year we made our first attempt at quantifying such performance hits, by comparing the Winstone benchmark test results of systems with and without utilities loaded. We advised vendors and consumers to take heed, since many of the packages caused performance degradation on our tests—especially when used in combination. Did anyone listen?

This year, to calculate performance differences, we ran our ZD Business Winstone 98 benchmark tests on a Micron Millennia Pentium/200 running only Windows 95. After we installed each utility or combination of utilities (using the program's default settings), we ran Winstone 98 again and compared the results. The difference gave us a rough idea of the performance degradation or improvement.

Last year's versions of Norton Utilities and Norton AntiVirus, loaded together on a system, caused a 20 percent performance hit on the Winstone tests. For our 1998 Utility Guide, in this issue, we put to the test some of our Editors' Choice winners—Backup Exec for Windows 95, CleanSweep Deluxe, Norton AntiVirus, Nuts & Bolts, and PKZip for Windows. The combination of these utilities caused a 7 percent degradation in system performance. This is good news, because it's unlikely that you'll notice performance changes that are less than 10 percent.

Most of the antivirus software we tested had a minimal impact on performance. Despite the need to examine all file I/O for suspicious code or activity,

most of the antivirus software had less than a 2 percent impact on performance. For example, our system ran just as well with Inoculan AntiVirus for Windows 95 as without it. And Norton AntiVirus produced an almost unnoticeable 1 percent performance hit, which was a vast improvement over last year's 8 percent hit. As was the case last year, PC-cillin

caused performance losses; although scoring better than last year (when the figure was 8 percent), the latest version of the software still caused a 7 percent performance hit.

With the exception of Norton AntiVirus, we were unable to run our Winstone 98 benchmark tests successfully with the Norton family of products. Based on discussions with Symantec and Ziff-Davis

Benchmark Operation, we discovered a conflict related to Symantec's inclusion of Microsoft's Distributed Component Object Model (DCOM) and our tests. DCOM is a protocol that enables software components to communicate directly over a network in a dependable and safe manner.

Symantec integrates DCOM into its products to take advantage of COM in the Utilities, Crash Guard, and Uninstaller Deluxe products.

The diagnostics packages registered a much wider range of scores. Both PC Care 97 and RealHelp Extra Strength actually helped improve system performance by about 1 percent, but First Aid 98 caused a 15 percent drop in performance. CheckIt version 5 hurt Winstone performance by 8 percent.

For the most part, we're pleased with the performance of the utilities in our Winstone testing. Even though some of them—and some combinations—may still cause some performance degradation, you can rest assured that you won't notice the performance hits.—Diane Jecker

THIS YEAR:

We loaded five utilities on a Micron Millennia P200 and ran our Winstone benchmark program; the overloaded system took only a

7%

PERFORMANCE HIT.

LAST YEAR:

We ran just two packages—Norton Utilities and AntiVirus—and they led to a

20%

PERFORMANCE HIT.

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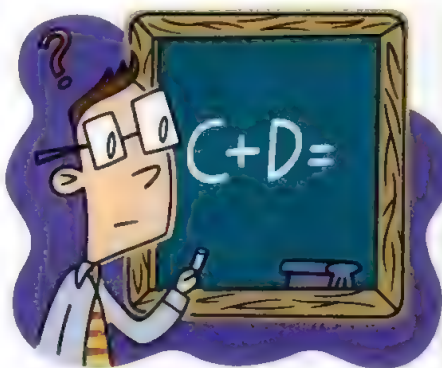
In the wake of the news of Compaq's plans to merge with Digital, questions are swirling about how the companies' product strategies will mesh. It's clear that a major attraction for Compaq was Digital's global service network. "We put tremendous value on the customer relationships Digital has cultivated over the past 40 years," says Compaq CEO Eckhard Pfeiffer. "We are committed to... investing in Digital's strategic assets, particularly its worldwide service organization." Less clear is what will become of specific Digital technologies, such as Alpha microprocessing.

Compaq pioneered the PC server business, but the company has never had the product offerings for running global enterprise systems. Digital does. It manufactures high-performance symmetric multiprocessing servers such as the AlphaServer 8400, which is loaded with 14 processors and 28 gigabytes

of memory. Digital brings to the table not only the 64-bit Alpha chip—the fastest of all the RISC processors—but also enterprise systems that run Digital Unix, OpenVMS, and Windows NT.

And those are exactly the systems that Compaq needs to extend its reach into the largest global enterprises. Compaq says its goal is getting 60 percent of its revenues from the enterprise market by the turn of the century; it currently gets 37 percent of its revenues in that arena. CEO Pfeiffer says that with the "scalability and robustness" of some of Digital's high-end platforms—such as Digital Unix—Compaq could win many new global enterprise contracts.

The announcement came shortly after a complex patent-infringement entanglement between Digital and Intel. Digital turned over the manufacturing of its 64-bit Alpha



chip to Intel, but it retains ownership of the Alpha design. The deal cast a shadow over Digital's commitment to the Alpha chips, whose future, say insiders, is fuzzy.

Michael Slater, editorial director of *Microprocessor Report*, says, "Compaq could use

Alpha to decrease its dependence on Intel. But if Compaq had really been interested in Alpha, then why didn't the company show enthusiasm before by building a strategy around it? My guess is that the Compaq/Digital news is not good news for Alpha."

Slater adds, "Compaq already has plans to do workstations based on the IA-64 chip from Intel, and Digital has also announced plans to build IA-64 machines. The combination of the two companies' efforts in the IA-64 arena should help move Compaq up the ladder."

—Sebastian Rupley and Carol Levin

JAKE KIRCHNER

Lewinsky and the Web Overwhelm the Press

The only thing sorer than the Washington press corp's performance during the first days of the Bill Clinton/Monica Lewinsky scandal was the widespread effort to blame the journalistic misfeasance on the World Wide Web.

Many Americans—and not just supporters of Bill Clinton—were dismayed at the rush by established print and broadcast news organizations to present gossip, rumor, and hearsay as fact. How many times did we see live news reports from the White House lawn to the effect that "if what we're reporting is true, the President is in serious trouble"? If? Since when has "if" been added to the who, what, when, where, and why of basic news reporting?

The press, roundly taken to task for this poor performance, meekly protested that "the Internet made us do it." It seems that when *Newsweek* delayed breaking this scoop of the year in order to nail down some of the details and corroborate some of the charges against the president, the story was leaked to the Web, where it spread like spam. The established national news organizations, evidently embarrassed by being beaten by the Matt Drudges of the business, decided they would not be scooped again.

The major media companies, for all their elaborate Web sites, have failed to learn a basic lesson about competing with the Internet. They have to differentiate their products from the offerings of the Web, just as they do in competing with tabloid newspapers, cable TV, and America Online. Many of these major news organizations' Web sites are nothing more than online companions to their print and broadcast offerings, rather than innovative, Web-centric publishing



efforts with enough compelling and different material to create separate audiences and compete effectively with the rumor sites and newsgroups of the Internet.

During the Gulf War, viewers of the 24-hour-a-day coverage of CNN learned that it was still worthwhile to spend 30 minutes in the morning with a good newspaper to put everything in perspective. Even die-hard followers of the Web's coverage of the Lewinsky affair will want to turn to *The New York Times* or CBS television to find out what's "really going on"—but only if those

established news organizations pursue their distinct missions. If they insist on acting like the Web sites they abhor, they will only make themselves superfluous and hasten their own downfall.

The lesson is one for all of us, really. What we should take from this mess is that the intrinsic egalitarianism of the Web, which allows people with no specific journalistic credentials or integrity to reach a worldwide audience, is both the wonder and the challenge of the Internet age. All of us have to learn what to trust and what to be skeptical of on the Web, just as—for now, at least—your school-age child is better off using the Internet to augment, not supplant, the local library when researching term papers.

As fast as the Web audience is growing, its sophistication is increasing just as rapidly. People quickly learn to distinguish between reliable Web sites and those that, although perhaps entertaining, are not reliable sources of news. Good information drives out bad, even on the Web. If your average Web user knows that, why don't the lords of the press? If they would stop complaining about the Web and do their jobs, we'd all be better off.

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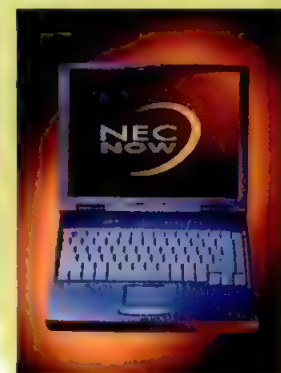
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NetPCs Come of Age

Since manageability has become an important criterion for the corporate computing world, a whole new category of computer systems has arisen: NetPCs.

Last year, Intel and a group of major industry players collaborated to develop the Network PC (NetPC) System Design Guidelines, a list of PC specifications meant to improve manageability, increase compatibility, and reduce technology costs for mid-size and large corporations. Typically a solid solution for large, vertical market corporations and companies involved in such areas

as data entry, customer support, and finance, NetPCs offer excellent manageability and compatibility at comparatively low prices.

Per the Design Guidelines, the NetPC integrates such features as remote management across the network, a Windows operating system, and the ability to run all Windows and Java applications. Furthermore, the NetPC has a sealed case, no external drives, and no hardware expansion slots. While significantly decreasing end-user modifications, the simplified nature of a NetPC makes it easier for an IT technician to configure, upgrade, repair, and maintain PC hardware and software. Dell, NEC, and Gateway 2000 are among the vendors now offering NetPCs that meet these specifications.

One of the coauthors of the NetPC specification, Dell Computer Corp. (800-388-8542, www.dell.com) has introduced the **OptiPlex N** and **OptiPlex NX**, with prices starting at \$930 and \$1,128, respectively (excluding monitor). Among the first sys-

tems to support the Advanced Configuration and Power Interface, the OptiPlex NetPC comes standard with a choice of Microsoft Windows 95 or NT 4.0, Smart UltraDMA/33 hard disks (2.1GB, 3.2GB, 4.3GB, or



6.4GB), and a three-year warranty with one year of on-site service. The OptiPlex N is outfitted with a 166-MHz, 200-MHz, or 233-MHz Intel Pentium MMX processor, 16MB of RAM, and an integrated S3 Trio64V2 PCI graphics controller with 2MB of VRAM.

The higher end OptiPlex NX comes equipped with a 233-MHz, 266-MHz, or 300-MHz Intel Pentium II processor, 32MB of RAM, integrated audio, and an ATI Rage Pro AGP graphics controller with 4MB of SGRAM memory. Extra options for the OptiPlex units include \$49 ACS90 Altec Lansing speakers and a \$299 15-inch monitor.

Of course, these machines adhere to the NetPC Design Guidelines: They use a "sealable" chassis, lack removable storage drives, and offer extensive remote management capa-

bilities, including DMI 2.0 compliance with Dell Inspector 4.1 and an Intel EtherExpress PRO/100+ network adapter with Wake-On-LAN technology. The OptiPlex NetPCs are optimal choices for use with Dell's PowerEdge 2200 configuration management server.

NEC Computer Systems Division (888-863-2669, www.nec-computer.com) offers a NetPC

compliant machine that's designed for use with servers such as those found in NEC's Express 5800 series. There are two models of the **PowerMate Enterprise NetPC** available, each with a "sealable" case, a 2MB SGRAM S3 Virge GX, a 64-bit PCI graphics accelerator, and inte-



NEXT GENERATION: NetPCs from Dell (above left) and NEC.

grated audio. The \$999 166-MHz Pentium MMX model includes 16MB of SDRAM, a 2.1GB hard disk, and Windows 95, while the \$1,199 200-MHz MMX version comes with 32MB of SDRAM, a 3.2GB hard disk, and Windows NT 4.0. A 15-inch color monitor costs an additional \$279.

The DMI 2.0-compliant PowerMate Enterprise NetPC packs in such system management hardware as a Smart UltraDMA/33 hard disk, NEC's MagicEye technology for sys-

tem health monitoring, and an integrated Intel EtherExpress Pro/100+ network adapter. It also comes with an ample bundle of management software, including Intel Client Manager 3.1, CyberMedia FirstAid 97, and McAfee VirusScan. As with the rest of NEC's PowerMate series of desktops, the Enterprise NetPCs are accompanied by lifetime 24-hour toll-free technical support and a three-year warranty with one year of on-site service.

Joining the NetPC game is Gateway 2000 (800-846-4208, www.gateway.com) with its new **E 1000N Net PC**. The E 1000N comes equipped with your basic NetPC features, including your choice of either a 200-MHz or 233-MHz Pentium MMX CPU, 32MB of SDRAM, and a 2GB Ultra ATA hard disk. In addition, each system features an integrated 2MB DRAM ATI

PCI graphics accelerator, a 10/100 TP Ethernet adapter, and Windows 95. Unlike the Dell and NEC models mentioned above, the \$1,079 166-MHz MMX unit includes a 15-inch color monitor and has a "lockable" instead of a "sealable" case.

As with all NetPCs, the E 1000N is meant for use in

conjunction with a management server, such as those offered in Gateway's NS-Series. The server monitors the desktop system's health with the help of the E 1000N's integrated LM78 ASCII, Intel LANdesk Client Manager 3.1, Magic Packet support, and Wake-On-LAN technology. Gateway gives E 1000N Net PC customers its Gold Service and Support, which comprises 24-hour toll-free technical support and a three-year warranty with one year of on-site service.

—Angela Tuka

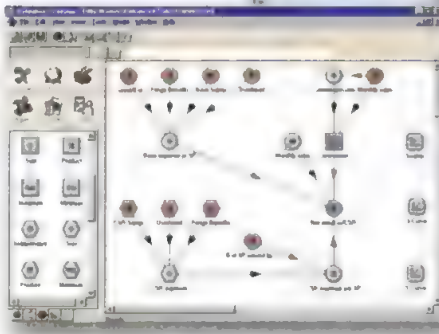
ANALYSIS

Decisions, Decisions...

In today's fast-paced business environment, it seems like there's never enough time to get anything done. Executives entrusted with decision making must come up with risk-analysis models and seemingly make up their minds on the spot.

MindWizard (\$150 street), from Richter Paradigm Corp. (888-366-4269, www.mindwizard.com), allows you to capture, display, and run your knowledge and reasoning to perform real-world business decisions without traditional programming skills. MindWizard is based on Richter's proprietary Neuronetics technology, which mimics the reasoning function of the human brain. Logic and reasoning activities are monitored as they occur on screen, so repetitive decision-making processes can be automated using a derivation of the user's own personal reasoning processes. Colorful, animated visual diagrams can be created with data from any OLE-compliant spreadsheet or database, and the

CHOOSING THE RIGHT PATH: Risk-analysis packages from Richter Paradigm (left) and Definitive Scenario.



results can be fed back to other programs for further processing.

Definitive Software (800-732-9414, www.definitivesoftware.com) offers **Definitive Scenario**, a \$195 standalone program that offers modeling and analysis capabilities in a nontechnical user interface with Monte Carlo simulation. It includes over 30 sample models, a Model Builder,

seven distribution types, 70 functions, over 15 types of reports and graphs, and bidirectional links to Microsoft Excel.

Micrografx's \$695 **Optima! 2.5** is a new, methodology-independent tool able to render processes that represent functional roles or departments within the organization (800-733-3729, www.micrografx.com). Optima! 2.5 is an integrated application for process analysis and the creation of "what-if?" scenarios. The program uses detailed process and functional role mapping, process behavior mod-

eling, and visual simulation. Diagrams created with Micrografx's FlowCharter can now be imported to Optima! for process modeling and analysis. With this version, you can process and save maps as HTML files for use on the Web.

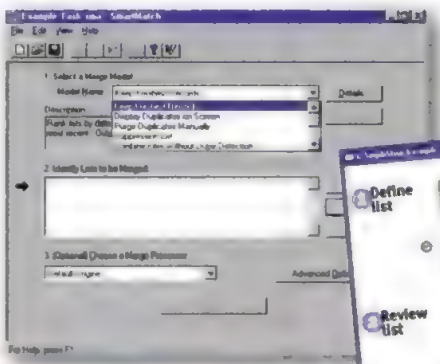
At the high end is **Crystal Ball Pro**, from Decisioneering (800-289-2550, www.decisioneering.com), a \$995 decision-optimization package that uses high-level risk analysis to allow decision makers to make more optimal choices in complex situations. Like Definitive Scenario, Crystal Ball uses the Monte Carlo simulation technique to determine the true probability of reaching specific outcomes in business, science, or engineering. The package also includes OptQuest, a global optimizer that helps determine an optimal choice for a decision based on multiple CrystalBall simulations. Search heuristics and neural network technologies track which solutions have worked in the past and then recombine them into new solutions.—Sharon Nash

MARKETING

Getting the Results

Marketing professionals know how easy it is to get bogged down in endless database files that seem to consist of nothing more than lists and names. Utilizing the right marketing-software solution for your needs can make a world of difference in how efficiently you manage your workload.

The **Smart Marketing Suite**, from Group 1 Software (888-413-6763, www.g1.com), is a database management system designed to streamline marketing and mailing processes. The latest component to be added to the suite is the \$595 **SmartMatch 1.0**. SmartMatch—which also includes ListManager 1.0—is a consumer merge/purge software system that uses a rule-based algorithm



PRODUCTIVITY ASSISTANTS: SmartMatch 1.0 (left) and MarketPlace Pro.

to detect duplicates. ListManager lets you extract critical data in order to manage information more effectively.

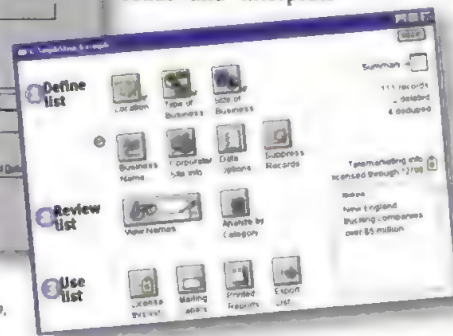
Aimed at reducing the amount

of time that sales and marketing professionals spend answering requests for proposals, Pragmatech Software has released **The RFP Machine, Version 3.0**, for Microsoft

Word (800-401-9580, www.rfpmachine.com). This \$1.195 program reads and interprets

the proposal document.

MarketPlace Pro, from iMarket (800-590-0065, www.imarketinc.com), is a powerful suite of CD-ROM marketing tools that leverages the depth of the Dun & Bradstreet databases to assist you in profiling existing customers, prioritizing new sales leads, and finding prospective customers directly from your desktop. There are two major components to the \$1,598 package: **D&B MarketPlace 4.0** (an analytical tool for profiling customers, targeting prospects, analyzing markets, and creating mailing lists) and **D&B MarketMatch** (an engine for matching and appending Dun & Bradstreet marketing data onto customer and lead records).—SN



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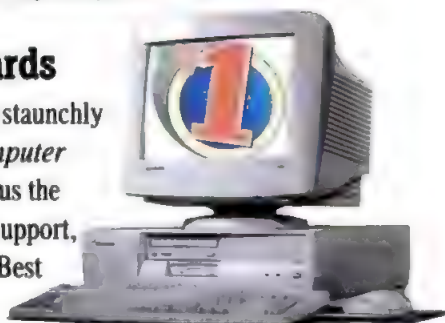
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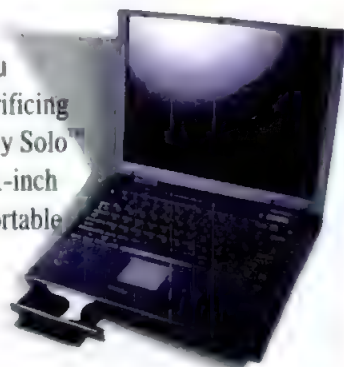
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It's no secret Gateway customers are staunchly loyal. We'd like to thank all the *Computer Shopper* readers out there who gave us the nod for their 1997 Best Service and Support, Best Place to Buy a Desktop PC and Best Value Desktop PC awards.



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E-Series Systems

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- 12X SCSI CD-ROM Drive & 3.5" Diskette Drive
- 3Com 10/100 Twisted Pair Ethernet Adapter
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- EV500 .28 Screen Pitch 15" Monitor (13.9" viewable)
- Integrated 32-Bit PCI Graphics with 2MB DRAM
- 13-Bay NS-8000 Server Tower Case with 325-Watt Power Supply, Includes seven External Bays (five 5.25" and two 3.5") and six 3.5" SCA Drive Bays (requires SCA drives)
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- ALR InforManager Server Management System with ActiveCPR Processor Protection

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Gateway GP6-233, PC World Power Desktop, October 1997

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- **Microsoft Action Titles** (available as an upgrade for \$99) Close Combat[™]; Flight Simulator; Age of Empires[™]; Monster Truck Madness[™]; DILBERT'S[™] Desktop Games and The Neverhood[™].
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Trends Peripherals

VIDEOCONFERENCING

Face-to-Face Telephony

Do your videoconferencing sessions look like jerky 1920s films and sound like you're talking to someone half a world away? The Stone Age of visual telephony may not be over yet, but these new tools from a wide range of vendors are the latest attempts to bring smoother video and audio clarity to your next bi-coastal chat.

Teles Corp. (888-835-3787, www.teles-usa.com) is offering the **ISDN Multimedia Kit**, an \$899 package that bundles a 30-fps (frame-per-second) Vision B5 PCI Multimedia Board with a 640-by-480 color camera, a headset with microphone, and Teles's own One-Step-ISDN setup and OnlinePowerpack software. The kit takes advantage of the extra bandwidth and multichannel capability of ISDN lines, providing a data-transfer rate of 128 Kbps. Also included are Microsoft's Internet Explorer 4.0 and NetMeeting 2.0.

If you're not attached to an ISDN line, take a look at these two cameras from the Panasonic Computer Peripheral Co. (800-742-8086, www.panasonic.com/alive). Designed to sit atop a PC monitor, the **EggCam GP-KR001** (\$130 street) produces images with 542-by-496 pixels and 330 lines of horizontal resolution. It has a built-in omnidirectional microphone that captures audio and an adjustable-focus lens that photographs subjects as close as 3.9 inches. The EggCam comes bundled with CU-SeeMe, VideoLink Mail, and VideoLink 324.

Smaller than a business card, Panasonic's **PM-S122 Clip-On** (\$500 street) attaches to your notebook's display and plugs into a PC Card slot. It can swivel up to 40 degrees and tilt up to 120 degrees when attached. The camera's image resolution is 542-by-497 pixels and 300 lines horizontal, and it can capture

subjects as close as 3.8 inches away. It comes with a headset with earphones and an adjustable microphone.

If audio isn't a priority and you need only a desktop tethered camera, Connectix Corp. now offers the \$129 **Quick-**

Cam VC (650-571-5100, www.connectix.com). A 355-by-288 pixel, 15-fps device with an adjustable-focus lens and 6-foot cable, the QuickCam VC comes with image-editing and video

e-mail software as well as VideoPhone 3.0 and Microsoft NetMeeting.

From Vista Imaging (415-802-9685, www.vistaimaging.com) comes the \$199.95 **ViCAM** tethered camera. The ViCAM produces video at up to 30 fps and features 24-bit True Color still-image capture at resolutions ranging from 160-by-120 to 640-by-480. The unit ships with MGI VideoWave SE+ and MGI PhotoSuite SE.

New from British vendor Vision (408-556-1550, www.vvl.co.uk) comes the \$165 **Vision Dual**, a tethered camera that can run through either a USB or parallel-port interface. It delivers frame rates of up to 30 fps and comes with digital zoom and hardware compression, mini-



SEE HERE: New videoconferencing cameras from Vista Imaging, Connectix, and Panasonic.

mizing CPU loading for videoconferencing applications.

Smile International (800-876-4532, www.smilekfc.com) offers the \$199 **SmileVision**, a tethered camera that uses an electronic auto-iris and has a resolution of 508-by-492 pixels and 220 lines horizontal. Built on a 360-degree tilt/swivel base, the SmileVision provides a full 50-degree viewing angle.—Roderick A. Beltran

MONITORS

Boxy Monitors Slim Down

More and more users are switching to large-screen monitors, but in this age of scarce desktop space in cramped cubicles and home offices, many people are finding that CRTs (cathode-ray tubes) are just too bulky. Monitor vendors are helping to ease the crunch

to cover the screen.

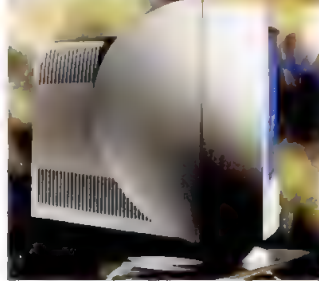
Hyundai Electronics of America's (800-568-0060, www.hya.com)

short-neck entry is the **DeluxScan HL7870S**, which is 17 percent smaller than a standard 17-inch monitor. The \$649 DeluxScan has a 0.27-mm dot pitch and a maximum resolution of 1,280-by-1,024 (at a 70-Hz refresh rate). It also includes Hyundai's antiglare/antistatic coating as well as Super Dark Tint to sharpen contrast.

Adding two new short-depth models to its PanaSync series of monitors is Panasonic Computer Peripheral Co. (800-742-8086, www.panasonic.com/alive). The 17-inch **PanaSync SL70** (\$600 street) and the 19-inch **PanaSync SL90** (\$900 street) are both 15 to 20 percent shallower than standard units with similar screen sizes.



SLIM SCREENS: Short-depth displays from Panasonic (left) and ViewSonic



with a new design that fits 17-inch monitors into the same footprint as 14- or 15-inch units. Employing a new "short-neck" CRT, this condensed design uses an electron gun with a wide 100-degree deflection area, which shortens the distance that light beams have to travel in order

At just 15 inches deep, the PanaSync SL70's footprint is equivalent to a 14-inch monitor. The unit features resolutions of up to 1,280-by-1,024 and a dot pitch of 0.27 mm. The 19-inch PanaSync SL90 is 16.48 inches deep (about the same as a 17-inch monitor). It has a dot pitch of 0.25 mm and can generate resolutions of up to 1,280-by-1,024. Both PanaSync monitors boast high refresh rates and come with Panasonic's new Atras antireflection and antistatic coating.

ViewSonic Corp.'s entry into the field (800-888-8583, www.viewsonic.com) is the **ViewSonic GS771** (\$550 street price), which also boasts a depth that is equivalent to a 14-inch unit. The ViewSonic GS771 has a dot pitch of 0.27 mm and a maximum resolution of 1,280-by-1,024 with an 87-Hz refresh rate. The monitor also features ViewSonic's SuperClear technology, which enhances brightness and color fidelity over conventional CRT monitors.—Josh Levy

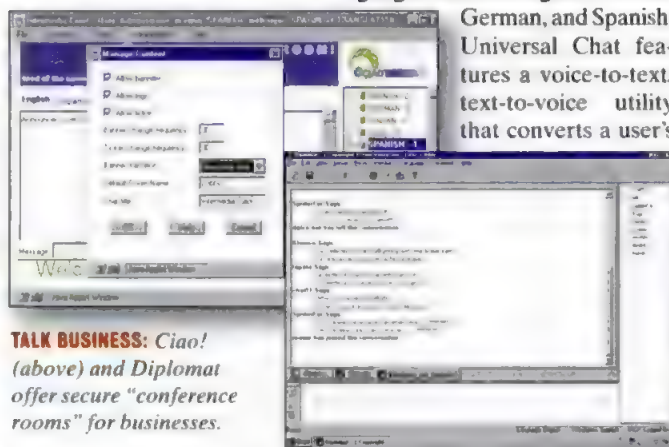
RECAP We reviewed 57 17- and 19-inch monitors in our issue of October 7, 1997. Editors' Choices were awarded to units from iiyama, Samsung, and Sony.

TRANSLATION SOFTWARE

International Language

As the global economy continues to evolve, the utility of translation chat packages becomes more apparent. These new products can assist businesses by providing secure chat rooms for meetings, alternatives to long-distance phone calls, and the ability to translate non-Latin languages like Chinese and Russian.

Intermedia's **Ciao! Multilingual Chat Server 1.1** (650-424-9935, www.intermedia.net) is a straightforward live chat server coupled with an extra-purchase translation module. Translation plug-ins support real-time conversations among English, French, German, and Spanish speakers. Business users can secure chat rooms with a password and even archive meeting protocols for their records. Chinese, Japanese, Russian, and other non-Latin



TALK BUSINESS: Ciao! (above) and **Diplomat** offer secure "conference rooms" for businesses.

languages will be a part of the product's latest release. The server costs \$495 with support for unlimited licenses, and each plug-in is priced at \$100 per language pair.

Universal Chat, from Language-Force (888-837-8887, [www](http://www.languageforce.com)

[.languageforce.com](http://www.languageforce.com)), is a dedicated server that allows multilingual users to communicate in real-time chat rooms. Supported languages include English, French, German, and Spanish. Universal Chat features a voice-to-text/text-to-voice utility that converts a user's

with four languages and the voice-to-text/text-to-voice feature costs \$100 for five to ten users. Corporate licensing fees run \$595 for 100 users and \$900 for 1,000 users.

Uni-Verse's **Diplomat** online/IRC translation service (888-800-3456, www.uni-verse.com) translates conversations in English, French, German, Italian, Portuguese, and Spanish multidirectionally and in real time. Users select the languages in which they want to send and read their own messages and the messages of others. Businesses can reserve "conference rooms" that allow access only to users with a password.

Diplomat 2.0, expected around the time you read this, should include Chinese, Japanese, and Russian along with voice synthesis and voice recognition plug-ins. It costs \$39.95 with unlimited access for six months and \$20 for an additional six months. One-year access costs \$30.—*Emily Cohen*

spoken words to text and "speaks" the words to the concurrent user. Universal Chat's expected release is March or April 1998, but a demo is now available on the Web site.

The Universal Chat package

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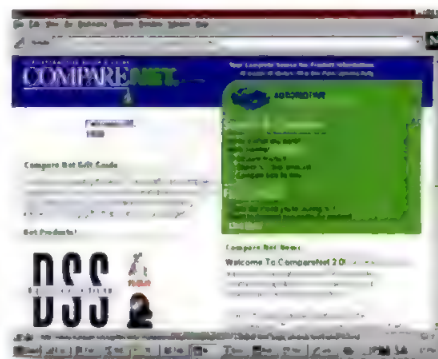
www.compare.net)—a buyers' guide site for items such as cars, stereos, and sporting equipment—recently added more products to its database. And along with a redesign of the site, it

added direct links to vendors who sell products over the Internet.

The products added to Compare.Net focus on electronics, appliances, and computer software and peripherals. Other home-office products are scheduled to be added to the site over the next several months. Agreements with Auto-By-Tel and Cendant Corp.'s net-Market and AutoVantage will allow shoppers to use Compare.Net's site to pick the ideal product and then purchase it through an instant link.

Compare.Net helps you make buying decisions by displaying comparative information based on price and features. The site also includes news updates, e-mail newsletters, interactive quizzes, and surveys.

PersonalLogic (619-220-5800, www.personallogic.com) recently introduced the PersonalLogic



DECISION HELP: Compare.Net directs you to vendors selling products over the Internet.

A Sensible Message

Small-business owners looking for cheap e-mail for their employees may want to check out **IMS Direct's** network e-mail service. For \$99.95 per month, IMS Direct provides ten employee mailboxes for the Internet and your intranet.

You don't need existing e-mail hardware or software with IMS Direct, from MicroData Group (800-924-0167, www.microdata.com). The service includes installation and configuration for \$150. IMS Direct utilizes Microsoft Exchange Client software, which is built into Windows 95, Windows NT, and Windows for Workgroups. All you need is a modem, telephone access, and an unused PC to serve as the gateway.

The \$99.95 fee allows for a monthly maximum of 800 total messages. Companies requiring more employee mailboxes can pay an extra \$8.95 per mailbox and 12 cents per exceeding message.—*Brett Krasnowe*



Easy-Start guides. Targeted for use by small and mid-size businesses on their own sites, PersonalLogic Easy-Start offers a selection of prepackaged personalized decision guides for such diverse topics as new and used cars and vehicles, cruises, mutual funds, computers, colleges, camcorders, and more. A new feature lets users make side-by-side comparisons between the features and characteristics of the various options they're considering.—*Melissa J. Perenson and Doug Beizer*

Going faster than the other guy
It's a prerequisite. Running the
hottest, most challenging of all



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Winstone 98 for Windows 95.



Cyrix Configuration: Microstar MS5164 Motherboard; ALI 1531 Chipset; Quantum Fireball ST43A013 disk drive; Diamond Multimedia Viper V330 PCI Graphics Card w/4MB SDRAM (driver rel. VP0015P); 1024x658 The Pentium II was tested on an ASUS P2L97 motherboard and the Triton 440LX chipset. Cyrix is a registered trademark and 6x86MX is a trademark of Cyrix Corporation. Windows 95 is a registered trademark.

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NETWORK CD-R

CD Duplication Made Easy

It comes as no surprise that today's software developers and corporations are requiring faster CD-R duplicators to meet increasing demands. Recent offerings by MediaFORM (800-220-1215, www.mediaform.com) and Microboards Technology (800-646-8881, www.microboards.com) might just help.

A new addition to MediaFORM's CD-R Copier family is the \$7,495 **CD-4600 CD2CD/PRO Series** standalone duplicator. With

the touch of a button, you can make this self-contained unit copy seven CDs simultaneously from a single CD source.

At the heart of the MediaFORM CD-4600 is the Smart Controller, which performs direct CD-to-CD copying without having to buffer through a hard disk. Equipped with 4X writer drives, the CD-4600 can duplicate a 74-minute CD in 18 minutes. Features include Pre Scan, which lets you check the master for any er-

rors prior to burning.

For greater capacity, you can network together up to three additional CD-4600 towers to burn 28 CDs simultaneously. An Easi-DAT digital audio import option is also available for importing data to the CD-R from any digital or audio source.

Hoei Sangyo Co. Ltd. and its U.S. distributor, Microboards Technology, have introduced the **DSR 8000** CD-R duplicator. Priced at \$7,495, the five-drive DSR 8000 master unit can record 15 CDs in 60 minutes. The



FEEL THE BURN:
The CD-4600
burns seven
CDs at once.

unit also has three slots for slave controller cards (\$1,295 per card). Each card allows you to manage recording for up to seven additional drives, allowing a fully laden DSR 8000 to run 26 CD-R drives. The card can also function as a PC SCSI network, enabling users to burn CDs on five CD-R drives without recording a master CD.

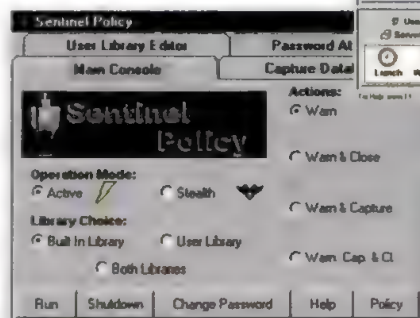
Up to ten DSR 8000 units can be daisy chained for the simultaneous recording of 260 CDs every 20 minutes. The DSR 8000 is also upgradeable to DVD-R.—Emily Cohen

FILTERING SOFTWARE

Web Time at Work

Corporations are quickly realizing the perils that accompany the benefits of giving employees Internet access. The legal, competitive, and productivity ramifications of unlimited surfing has companies looking at filtering products for their own servers. These products join the growing list of filtering and monitoring packages designed for the corporate market.

Surfcontrol Scout, from the Surfcontrol division of JSB Computer System Ltd. (800-572-8649, www.surfcontrol.com), lets administrators monitor and manage the who, what, when, and how of user Internet access. Scout can create a wide range of reports, such as business versus nonbusiness site access, time analysis, and user, protocol, or department analysis. You can even import the data into Microsoft Access or Crystal Reports for more flexibility. The software runs on Microsoft Windows NT server or Workstation and monitors



RATED PG: Internet filters let administrators keep Web surfing professional.

www.securitysoft.com), is a \$59.95 product that uses client-based technology with active and stealth modes for monitoring and blocking inappropriate Web, e-mail, newsgroup, and application usage. In active mode, employees accessing a restricted site are greeted with a company-policy screen detailing the violation. In stealth

mode, the user's ID, the date and time, the name of the application, the cause of the violation, and a screen capture are all stored in a database. The administrator's options include warning, capturing, and closing the application.

Cyber Patrol Corporate, a subsidiary of The Learning Company (800-227-5609, www.learningco.com), works like Cyber Patrol, its sibling product for families, featuring both blocking and time management functionality. For the corporate edition, the administrator can control filtered access to the Web, FTP, newsgroups, and IRC chat sites. It also has a special filter for sports and entertainment.

The administrator creates up to ten user profiles that can set access levels for each employee. Designed for both Novell and Windows NT networks, Cyber Patrol Corporate can set system-wide restrictions or restrictions based on work or leisure time periods.—Jay Munro

Jigsaw 8 Solves the Throughput Puzzle

For the past couple of years, if you needed high speed I/O throughput between your servers and disk arrays, you had only one choice: Fibre Channel. But now the SCSI industry is fighting back. GigaLabs (800-526-8120, www.gigalabs.com) recently released its **Jigsaw 8** Ultra 2 SCSI switch.

Starting at \$2,000 per port in a Windows NT configuration, this eight-port switch offers 80-Mbps throughput (Fibre Channel features 100-Mbps throughput), all without the expense of upgrading your legacy infrastructure to fiber.

Because it has a switched topology

and doesn't do protocol translation, the Jigsaw 8 is not confined to SCSI's normal 25-meter and 15-device limitations. The unit's fiber cabling can make up to a 20-km connection. And by cascading multiple switches, an Ultra2 SCSI network theoretically can support a maximum of 122,850 devices.

The Jigsaw 8 operates as a transparent device; servers see the unit as a storage peripheral. It comes with drivers for SCSI, ATM, and HIPPI interfaces, with plans in the works for Gigabit Ethernet and Fibre Channel interfaces.—Robert Daly



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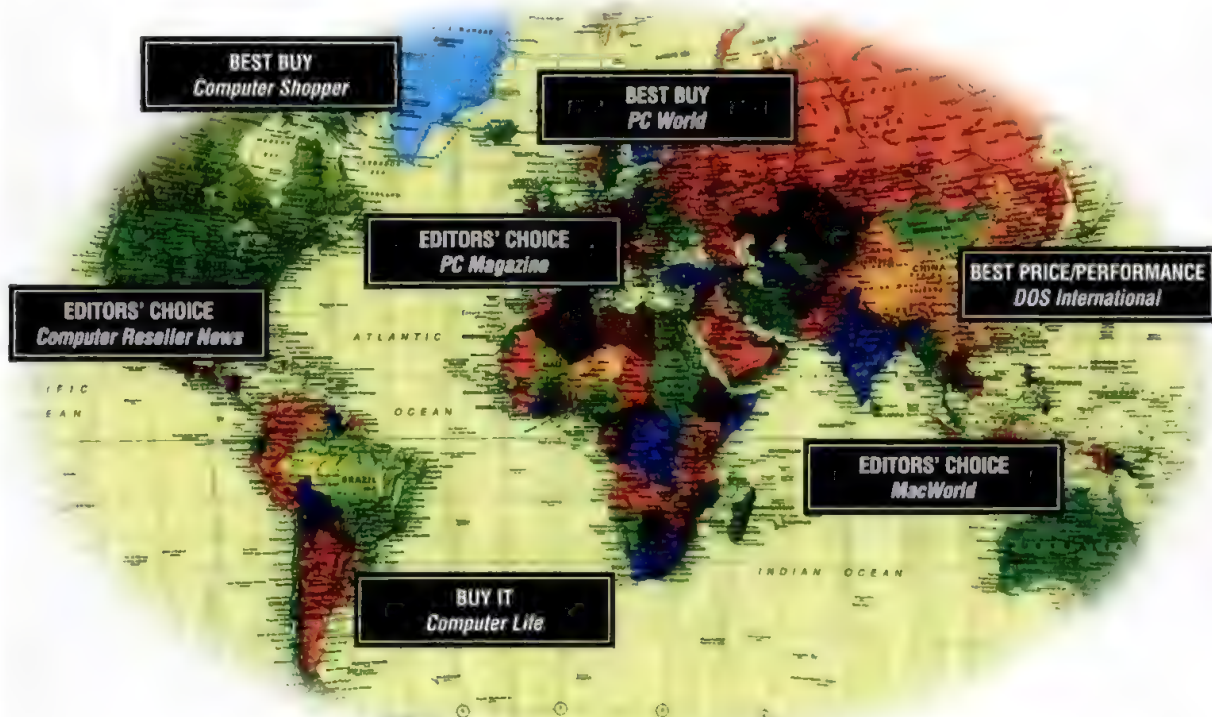
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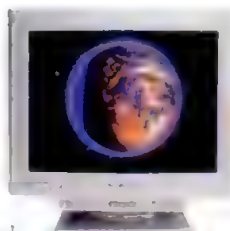
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September 1997

First Looks



By Carol Venezia

A year ago, when Compaq Computer Corp. introduced its first "subzero" PC—industry slang for a PC costing less than \$1,000—few people noticed. Those who did quickly wrote it off as either a passing fluke or a bad business idea. They couldn't have been more wrong.

Unless you've been living under a rock for the past year, you know that the low-cost PC is the hottest area of the market today. And PC manufacturers are scrambling to scarf up a piece of the pie.

How many PCs leaving the CompUSA and Circuit City stores of the world are subzeros? The numbers vary by source, but estimates peg this category at approximately 25 percent of all retail PC sales; numbers as high as 40 percent were recorded in August 1997, in a month that is typically a boon season for back-to-school shopping.

But although sales are certainly brisk, there have been casualties in the PC market. In late November, Toshiba decided to discontinue its Infinia home PC line. The subzero category had a direct impact on this decision.

In short, the people have spoken: Many won't pay more than \$1,000 or so for a PC. Top-tier vendors have responded to this call, but what does the shift mean for Wall Street? Lower prices mean thinner margins, which in turn mean less profit. Companies like Compaq, Hewlett-Packard, IBM, and Micron can sustain these razor-thin margins better than other vendors, simply because subzeros represent such a small part of what they do. But for Packard Bell NEC, in particular, the waters may be rough, because it plays nearly exclusively in the retail home PC market with its Packard Bell brand.

WHAT THEY ARE...

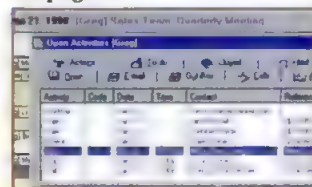
For this roundup, we gathered brand-new PCs from the five market leaders: Compaq, Hewlett-Packard, IBM, Micron, and Packard Bell. The prices range from \$849 for the HP Pavilion 3260 (including a base price of \$799, plus \$50 for an extra 1MB of video memory for our tests) to \$999 for the Compaq Presario 4540, IBM Aptiva E26, Micron Millennia SE233, and Packard Bell Multimedia S606. Be aware, however, that none of these prices include monitors—one of the great gotchas of the subzero segment.

The processors offered vary: The Compaq and IBM units run on 233-MHz K6 CPUs, the HP uses the Intel 200-MHz Pentium MMX, and the Micron and Packard Bell systems use Intel's 233-MHz Pentium chip. Each system includes at least a 2GB hard disk (3.2GB was the average), 32MB of RAM, at least a

INSIDE

STRIKE IT RICH:

GoldMine 4.0 wants to be your all-purpose contact manager. For the full story, see page 56.



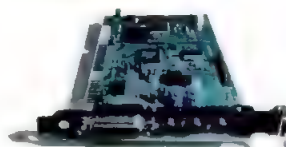
WINNING DRAW:

CorelDraw 8 adds more tools, special effects, and bundled software to its leading illustration program. See page 60.



WATCH OUT:

Shark Multimedia's Predator 3D audio card offers full-bodied, high-powered audio for your computer. For the full story, see page 64.



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First Looks

BENCHMARK TESTS

Sub-\$1,000 PCs



On our applications-based Business Winstone 98 tests, the top performer was the Micron Millennia SE 233, which came loaded with 512K of L2 cache; a close second was the Compaq Presario 4540, with 256K of cache. The 3D WinMark 98 scores of all five PCs were extremely low compared with the top performers in our

latest home PC roundup (December 16, 1997), which scored as high as 526. That's because, though most have the capability of processing graphics calls in hardware, none came pre-loaded with a 3-D hardware abstraction layer (HAL), so all 3-D processing was performed in software. We tested all units at 800-by-600 resolution with 16-bit color.

	ZD Business Winstone 98 Score	ZD Business Graphics WinMark 98 Score	ZD Business Disk WinMark 98 Thousands of bytes per second	ZD 3D WinMark 98 Score	ZD CPUmark ₃₂ Score	ZD CD-ROM WinMark 98 Thousands of bytes per second
Bold type denotes first place.						
Compaq Presario 4540	15.7	93	864	12	441	1,300
HP Pavilion 3260	11.6	59	972	13	287	1,020
IBM Aptiva E26	13.1	63	790	11	390	1,320
Micron Millennia SE 233	16.9	87	1,150	15	450	1,090
Packard Bell Multimedia S606	11.6	59	767	15	285	1,240
	BETTER ►	BETTER ►	BETTER ►	BETTER ►	BETTER ►	BETTER ►

16X CD-ROM drive, integrated graphics and audio, and a 56-Kbps modem. In addition, each system is preloaded with Microsoft Windows 95 and a Web browser, and each comes with a smattering of software titles.

... AND WHAT THEY'RE NOT

We've said it before, and we'll say it again: These machines' prices don't include monitors. Expect to pay about \$300 to \$400 more (Micron's is only \$200) for a matching monitor from each vendor, depending on whether you choose a 14- or 15-inch display.

Expect to make compromises in technology as well. Due to the price of the SRAM and the costs of putting it on the motherboard, you typically don't see secondary processor caches on subzero systems, even though it's now standard fare in the rest of the PC market.

Also, you may have limited room to expand. The Compaq and HP units, for example, have smaller-than-average cases, and the vendors had to cut something out; that something was expansion slots and drive bays. If you don't plan to crack open their lids, these machines will serve you well.

Another thing you might have to settle for is 800-by-600

display resolution if you want a decent refresh rate. At PC Labs, we test PCs at 1,024-by-768, 16-bit color, and a 75-Hz refresh rate. But because some of the subzeros' monitors can't handle that high a resolution at 75 Hz (they'd bump down to an eye-straining 60 Hz), we tested them at 800-by-600, 16-bit color, and 75 Hz.

Also worthy of note here is the fact that more than one of the subzero vendors touts the fact that their graphics engines support Direct3D, which would lead you to believe that at least some of the 3-D processing is happening in hardware. But if the machines we tested at PC Labs are any indicator, they're missing one essential piece: a D3D hardware abstraction layer (HAL). Without the D3D HAL, all 3-D functions has to be handled in software, which is significantly slower than hardware.

WHAT TO BUY

If you're on a budget, any one of the subzeros reviewed here is a good choice. HP's Pavilion is a bargain: Although its hard disk is a bit smaller and its processor subsystem is a bit slower than the competition's, it's also the least expensive unit here. The Compaq system offers the best

package, combining excellent performance with a solid software bundle and consumer-oriented customization. Meanwhile, the Micron—this roundup's best benchmark-test performer—offers the most opportunity for expansion.

Compaq Computer Corp.

Compaq Presario 4540



If any vendor has been generating headlines in the sub-\$1,000 PC space, it has been Compaq Computer Corp. This is not surprising, because Compaq was the first serious player in this market, entering just over a year ago with a full lineup of low-cost PCs. The latest entry to the line—the K6/233-powered Compaq Presario 4540 (\$999 street)—provides the best package of features and performance, which is why it's our Editors' Choice.

The case design is unique to Compaq; the unit can best be described as a micro-mini-tower. Measuring 14 by 7.5 by 11 inches (HWD), the Compaq unit mirrors standard mini-towers in the first two dimensions but cuts approximately 8 inches off the back. The result is a housing that can easily dwell on your desktop

without taking it over completely. On the front bezel you'll find an Instant Internet button (just push the button to launch your Web browser), a Sleep button (which puts the machine into low-power suspend mode), and volume control for your speakers.

Getting inside the Presario's case is simple enough: Just remove three torque screws from the rear, then slide off the cover. Peer in and you'll notice that there are no internal drive bays (although there is one 5.25-inch front-accessible bay). But if you want to get to the motherboard to upgrade the memory, you'll need to get your screwdriver

Compaq Presario 4540

Street price: \$999
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back out. To upgrade the RAM, you must remove two screws from the vertically mounted motherboard, swing the board out of the case, and then unplug the CD-ROM drive, floppy disk drive, hard disk cables, and power-switch connector. And because there's only one socket for SDRAM, you'll have to toss what's there to upgrade. We suggest buying this system equipped with the maximum amount of RAM you think you'll need.

On the motherboard, you'll find a 233-MHz AMD K6 processor, 256K of L2 cache, and Intel's 430VX chip set. The PC performs graphics tasks using the integrated S3 Trio64 V2-DX engine with 2MB of VRAM, and it offers sound with an ESS Audio-Drive chip. There are also two ISA slots and one ISA/PCI slot; a K56flex modem occupies one ISA slot.

The Presario's performance was excellent, and like the Micron—the only system with better performance—it has L2 cache. The system posted the second highest ZD Business Winstone 98, ZD Business Graphics WinMark 98, and ZD CPUmark₃₂ scores. Its ZD Business Disk WinMark 98 score fell a bit below the HP unit's, but it beat out the scores of the IBM and Packard Bell systems.

Compaq has done a good deal

Editors' Choice

• Compaq Presario 4540



Of the five subzero systems we looked at in this roundup, Compaq

Computer Corp.'s Presario 4540 does the best job at balancing performance with the out-of-box consumer experience.

The Presario's sleek chassis design offers a slimmer, smaller footprint than a normal mini-tower, and it incorporates conveniently placed Sleep mode, volume control, and Internet access buttons. At \$999 (street price), the system is equipped with a 233-MHz AMD K6 CPU, 256K of L2 cache, Intel's 430VX chip set, a K56flex modem, and an integrated S3 Trio64 V2-DX graphics engine with 2MB of display



memory. Sound is provided by an ESS Audio-Drive chip. The Presario proved to be an excellent performer on our benchmark tests, largely because of the machine's L2 cache. And a generous software bundle provides you with everything you need to get off the ground with your new PC. The only drawbacks here are the Presario's lack of expansion space and cramped, difficult-to-access interior.

If expansion potential and performance are your main concerns, look instead toward our Honorable Mention, the Micron Millennia SE 233. Our overall performance champion, the

Millennia features a 233-MHz Pentium CPU, a 3.2GB hard disk, 32MB of RAM, Intel's 430HX chip set, 512K of L2 cache, a Diamond Stealth 3D 2000 graphics card, integrated Creative Labs SoundBlaster 16 audio, and a 56K x2 modem. The one thing this system is short on, though, is software: the Millennia comes only with Microsoft Windows 95.

of customization for you. The preloaded browser is Microsoft Internet Explorer 4.0, and the Favorites tab on the Start menu contains a wide array of preset quick launches for applications and Internet sites, including those for Microsoft FrontPage, Microsoft Outlook Express, CNN Interactive, the Compaq Chan-

nel, and ZDNet. And to sweeten the deal, Compaq includes 50 hours of free access if you choose Easy Internet Access from the Compaq Internet Setup. This is a 90-day trial, during which you may use up to 2 hours per day.

Compaq offers a variety of Presario monitors; we looked at the Presario 1525 (\$350 street), which has a number of front-mounted controls, including volume and mute for the monitor's side-mounted, adequate JBL Pro speakers mount. The keyboard, however, is disturbingly lightweight and flimsy.

The Presario comes with an array of Microsoft titles (including Works, Encarta, Money, and Bookshelf) and Intuit's Quicken Basic 98. The system includes CDs for all programs as well as a system recovery CD.

Minor quibbles aside, this is an impressive machine for those on a budget. If you're not afraid of screwdrivers or you don't plan on cracking open the case, consider the Compaq Presario 4540.

Hewlett-Packard Co.

HP Pavilion 3260 Multimedia PC

Like the Compaq Presario 4540, the HP Pavilion 3260 Multimedia PC (\$799 street, plus a \$50 1MB display memory upgrade) doesn't have many expansion options. Nevertheless, unlike the Compaq unit, the Pavilion is incredibly easy to access for upgrading.

The Pavilion's slimline desktop case has approximately the same depth as a standard desktop PC, but its front bezel and height are about 3 inches shorter than regular desktop fare. The front bezel shows where that extra space has gone: There are no available front-accessible drive bays. All you see up front is the floppy disk drive and the front of the 16X CD-ROM drive.

Setup is a snap even for beginners, thanks to a setup poster and color-coded cables. And ac-



First Looks

cessing this PC's innards is very easy: Just remove three screws from the back and slide the cover off. Inside, you'll find a 200-MHz Pentium MMX CPU, a 2.1GB Western Digital hard disk, an empty 3.5-inch drive bay for expansion, one ISA slot (which was occupied by a K56flex modem on our test machine), and one shared ISA/PCI slot. The PC also has two DIMM sockets; on our test unit, however, a 16MB SDRAM stick occupied each one. If you purchase this machine, you should request one SDRAM module, which will provide an open slot for upgrading RAM.

The Pavilion's motherboard also carries a 430TX chip set but no secondary processor cache. Graphics are handled by an integrated ATI 264-VT2 accelerator with 1MB of EDO DRAM;



for our testing, Hewlett-Packard upgraded the display memory to 2MB so the system could handle the tests' resolutions. Also, a Crystal audio chip is integrated on the planar.

On our benchmark tests, the Pavilion tied with the Packard Bell unit for the lowest ZD Business Winstone 98 score, and it posted the lowest ZD Business Graphics WinMark 98

score; both scores were affected by the lack of secondary processor cache. The HP did redeem itself on the ZD Business Disk WinMark 98 tests, garnering the highest score. Its ZD 3D WinMark score was also a bit higher than the Compaq and IBM units' scores.

Of the systems we tested, the Pavilion provides the best documentation and the best setup and online help. Hewlett-Packard preloads the HP Support Center (which provides PC management and Windows 95 tutorial), answers to common questions, and a system maintenance area, including McAfee's VirusScan and instructions for the system recovery CD. The most useful aspect—provided your computer is functional—is the one for technical support. Here you'll find support phone numbers for Hewlett-Packard and all installed software. For most calls, you pay \$25 each after the free-support period has expired.

HP bundles a smattering of software with the Pavilion, including Intuit's Quicken Basic 98; Microsoft Encarta 98, Works, and Money; and, for kids of all ages, EasyPhoto and SimCity. The preloaded browser is IE 3.02.

There are several displays offered to match the Pavilion; we looked at the HP Pavilion M50

SUMMARY OF FEATURES

Sub-\$1,000 PCs



	Compaq Presario 4540	HP Pavilion 3200 Multimedia PC	IBM Aptiva E26	Micron Millennia SE	Packard Bell Multimedia S606
Price of tested configuration	\$999 street	\$849 street (with \$50 1MB display memory upgrade)	\$999 street	\$999 direct	\$999 street
15-inch monitor (price)	Presario 1525 (\$349 street)	Pavilion M50 Multimedia Display (\$399 street)	IBM G52 (\$349 street)	Micron 500FG (\$200 street)	Packard Bell 5480 (\$349 street)
Processor	K6-233	Pentium MMX/200	K6-233	Pentium 233	Pentium MMX 233
L2 cache	256K	None	None	512K	None
Hard disk	3.2GB Quantum Bigfoot	2.1GB Western Digital Caviar 12100	3.2GB Seagate Medalist	3.2GB Western Digital Caviar 23200	4.3GB Seagate Medalist
Graphics adapter (interface)	S3 Trio64 V2/DX (integrated)	ATI VT2 (integrated)	ATI 3DRage II+DVD (integrated)	Diamond Stealth 3D 2000 (PCI)	S3 Trio64 V2/DX (integrated)
Core logic chip set	Intel 430VX	Intel 430TX	ALI	Intel 430HX	Intel 430VX
Expansion-bus slots	2 ISA, 1 ISA/PCI	1 ISA, 1 ISA/PCI	3 ISA, 2 PCI, 1 ISA/PCI	2 ISA, 2 PCI, 1 ISA/PCI	3 ISA, 2 PCI
Front accessible drive bays (5.25" / 3.5")	2 / 1	1 / 1	2 / 1	2 / 3	3 / 1
Internal drive bays (5.25" / 3.5")	0 / 0	0 / 1	0 / 0	0 / 1	0 / 2
Parallel serial ports	1 / 1	1 / 1	1 / 1	1 / 2	1 / 2
USB/MIDI ports	2 / 1	2 / 1	2 / 1	2 / 0	1 / 1
Audio (interface)	ESS AudioDrive (integrated)	Crystal Audio (integrated)	Crystal Audio (integrated)	Creative Labs SoundBlaster 16 (ISA)	Crystal (integrated)
CD-ROM drive speed	20X	16X	24X	16X	20X
Modem	K56flex ISA	K56flex ISA	K56flex ISA	K56flex ISA	x2 ISA
Bundled software	MS Works, Quicken Basic 98	MS Encarta 98, MS Money, MS Works, Quicken Basic 98	Lotus SmartSuite (1 2-3 Organizer, WordPro)	None	MS Encarta, MS Money, MS Word 97, MS Works, Quicken Basic 98
Standard warranty	1 year	1 year	1 year	1 year	1 year
On-site service	90 days	30 days	None	1 year	None

A 333MHz PENTIUM II SYSTEM WITH A 17" MONITOR FOR \$2,399*



MILLENNIA® Xku 333

Intel 333MHz Pentium® II processor
(features MMX™ technology)
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512KB internal cache, 2MB BIOS
Integrated 100 MB Iomega Zip drive, 3.5" floppy
32X EIDE variable speed CD-ROM drive
Advent 009 speakers with subwoofer
3Com/US Robotics 56K x2 data/fax modem
Diamond Viper 128-bit AGP 3D video with 4MB SGRAM
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Cons. lease \$42/Mo.

Commercial financing options are not available for this system

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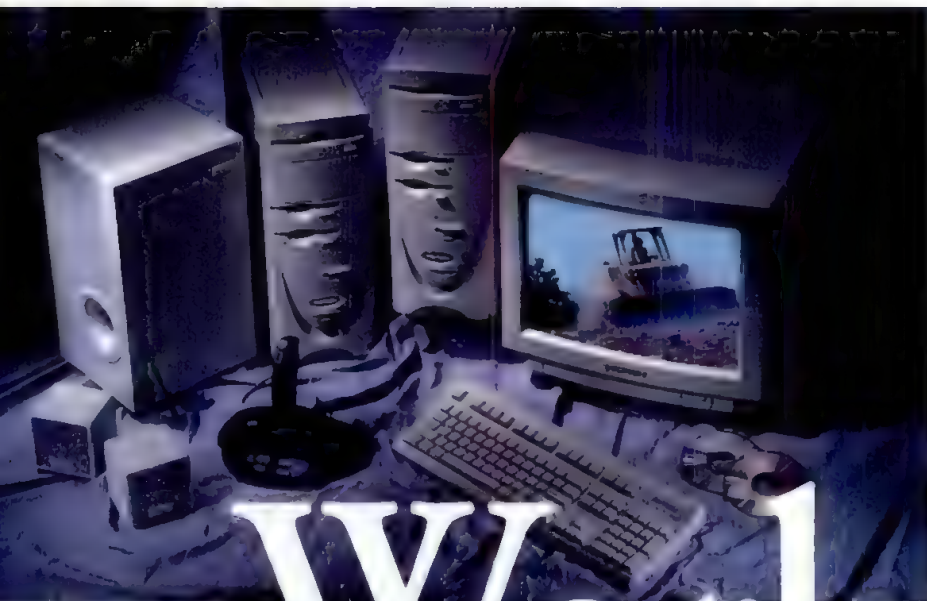
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32MB ECC SDRAM
2GB Ultra Wide SCSI-3 hard drive
Microsoft® Windows NT® Server 4.0 (10-user license)
NOS support (3 incident resolutions/1st year), 7x24

STANDARD FEATURES

Single or dual Intel Pentium II processors
512KB integrated cache in SEC package
ECC SDRAM option (4 DIMM slots)
5 expansion slots: 4 PCI, 1 ISA
Integrated Adaptec PCI Ultra Wide SCSI-3 controller
Intel EtherExpress™ Pro 100 NIC
12X SCSI-2 CD-ROM drive
10 drive bays: 4 external 5.25"/1 external 3.5"/
2 internal 5.25"/3 internal 3.5"
Intel LANDesk® Server Manager v.2.8
Dedicated server technical support, 7x24
5-year/3-year Micron Power™ limited warranty
1-year next-business-day on-site service*

\$3,499

Bus. Lease \$119/mo.

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Intel 300MHz Pentium II processor
64MB ECC SDRAM
4GB Ultra Wide SCSI-3 hard drive
Microsoft Windows NT Server 4.0 (10-user license)
NOS support (3 incident resolutions/1st year), 7x24

STANDARD FEATURES

Single or dual Intel Pentium II processors
512KB integrated cache in SEC package
Memory: ECC EDO or SDRAM option
9 expansion slots: 6 PCI, 2 ISA, 1 shared ISA/PCI
Dual integrated Symbios Ultra Wide SCSI-3 controllers
Intel EtherExpress™ Pro 100 NIC
Embedded RAID upgrade option
I/O ready via embedded Intel i960-RD
5 internal, hot-pluggable, hard drive array bays
(Upgradable to 10)
1 (one) 360 watt hot-pluggable power supply standard
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1-year next-business-day on-site service*

\$5,699

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**Price excludes monitor.

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32X ATAPI variable speed CD-ROM drive
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Dragon NaturallySpeaking Personal voice recognition software
CardBus and Zoomed Video
2 infrared ports, S-Video, NTSC, game USB ports
Mobile Software Solutions
2 Modular expansion bays
Custom nylon carrying case
Microsoft® Windows® 95 and MS® Plus!
Microsoft Office 97 Small Business Edition
5-year/1-year Micron limited warranty

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166MHz Intel Pentium processor with MMX technology
16MB EDO RAM (40MB max.)
1.6GB hard drive
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Li-Ion battery
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256KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator
MPEG compatible
Zoomed video-ready
Touchpad pointing device
Microphone and 16-bit stereo sound
2-way infrared port
Modular floppy drive
Microsoft Windows 95 and MS Plus!
5-year/1-year Micron limited warranty

\$2,249

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Micron TransPort XKE 233

233MHz Intel Pentium processor
with MMX technology
64MB EDO RAM
3GB removable hard drive
13.3" TFT XGA display

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2nd and 3rd year parts and labor; 3-business-day turnaround for 3 years*	\$269
2nd and 3rd year parts and labor; 7-business-day turnaround for 3 years*	\$209

Micron TransPort XKE 266

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TransPort Options

VLX Options: Motorola Montana 33.6 fax/modem, Dragon NaturallySpeaking Personal voice recognition software, 3Com PCMCIA ethernet adapter, 10-Base-T, custom nylon carrying case, Samsonite leather carrying case, 2nd Li-Ion battery, 2.1GB primary hard drive upgrade, 8MB EDO RAM upgrade (24MB total), 24MB EDO RAM upgrade (40MB total)

XKE Options: Microsoft Windows NT 4.0, MicronDock™ multimedia port replicator with hot docking and built-in battery charger, Micron Executive™ desktop package: matching black monitor, mouse and keyboard, PCMCIA Ethernet adapter, 10/100 Base-T, leather carrying case upgrade, 2nd modular lithium-ion battery, primary and secondary modular HDD upgrade options up to 5GB, memory upgrade options up to 192MB, auto/air adapter, Multimedia Xcitement Pak

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Integrated 100MB Iomega Zip drive, 3.5" floppy drive
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32 voice wavetable stereo sound with speakers
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EdVenture Pak: Creatures by Mindscape, Freddy Fish 2 by Humongous Entertainment, Schoolhouse Rock by Creative Wonders, Reader Rabbit: Kindergarten by The Learning Company, Dr. Seuss Green Eggs and Ham by Broderbund†

Arcade Pak: X-Wing vs. TIE Fighter, Need For Speed 2, Command and Conquer: Red Alert, 4 button game pad†

Fusion 3D Option Pak

DVD-ROM,** DVD software
DVD PCI decoder card
AWE 64 ISA sound card, Cambridge MicroWorks:
2 speaker satellite with subwoofer stereo system
Fusion 3D game pak: Mech Warrior 2: Mercenaries
D3D version, AH-64D Longbow, U.S. Navy Fighters '97, Command & Conquer, Formula 1 D3D version
Microsoft SideWinder Pro joystick

Available only on
Millennia XKU systems

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Millennia XKU

STANDARD FEATURES

82440LX chip set
512KB internal L2 cache, 2MB BIOS
Integrated 100MB Iomega Zip drive, 3.5" floppy drive
32X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound,
Advent 009 speakers with subwoofer
3Com/US Robotics 56K x2 data/fax modem*
Diamond Viper V330 128-bit 3D video
with 4MB SGRAM
Microsoft IntelliMouse, USB connections
Microsoft Windows 95 and MS Plus!
Microsoft Office 97 Small Business Edition
Choice of Micron Software Solutions Pak
5-year/3-year Micron Power limited warranty

Millennia XKU 266

Intel 266MHz Pentium II processor
(features MMX technology)
32MB SDRAM
6.4GB Ultra ATA hard drive
17" Micron 700FGx, .26dp
(16" display)

\$2,249

Bus. Lease \$79/mo.

Millennia XKU 300

Intel 300MHz Pentium II processor
(features MMX technology)
64MB SDRAM
6.4GB Ultra ATA hard drive
17" Micron 700FGx, .26dp
(16" display)

\$2,499

Bus. Lease \$87/mo.



Millennia XKU 333

Intel 333MHz Pentium II processor
(features MMX technology)
64MB SDRAM
8.4GB Ultra ATA hard drive
17" Micron 700FGx, .26dp
(16" display)

\$2,799

Bus. Lease \$96/mo.

*Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and observed transfer rates may be less than the maximum potentials.

**The CD-ROM drive will be removed upon the purchase of the DVD upgrade.

Available only on Millennia systems with Microsoft Windows 95.

Software upgrade may be required to achieve maximum transmission speeds. Software upgrades are available for download from Micron's Web page for free www.micronpc.com.

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Supports dual processors
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512KB pipeline burst cache, flash BIOS
Memory upgradeable to 1GB ECC SDRAM
3Com Fast EtherNet 10/100 PCI network adapter
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DMI, software and hardware management support
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Microsoft® IntelliMouse™
Microsoft Windows NT® Workstation
5-year/3-year Micron Power™ limited warranty

Powerdigm Xsu

Intel 300MHz Pentium® II processor
Samurai™ chip set
Fire GL 1000 pro 8MB 66MHz PCI Open GL
Professional 3D accelerator
4GB Ultra-Wide SCSI-3 hard drive
64MB ECC SDRAM
19" Hitachi SuperScan CM751
(18" display) .26dp monitor

\$4,699

Bus. Lease \$149/mo.

Powerdigm Xsu

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Samurai chip set
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Fire GL 4000 15MB 3DRAM/16MB CDRAM
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(20" display) .26dp monitor

\$8,308

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Advent AV370 Powered Partners stereo speakers with subwoofer	\$199
Microsoft SideWinder™ 3D Pro joystick	\$59
AWF 64 ISA sound card	\$75

Storage/Media Options

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Iomega 6-pack of 100MB Zip cartridges	\$99
Sony 4/8GB SCSI DDS-2 tape backup drive with tape and software	\$899
Seagate TR-4 4/8GB IDE tape backup w/software	\$239
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21" Hitachi SuperScan CM801 (20.0" display) .26dp color monitor	\$650
Number Nine Revolution 8MB video card	\$249

Software Options

Small Business Essentials: QuickBooks, Visio, Norton AntiVirus, Astound, Focal Point, American Yellow Pages	\$179
CorelDRAW 7 (full retail version)	\$299
Corel WebMaster Suite (full retail version)	\$99

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HP Deskjet 890Cxi	\$429
HP LaserJet 6Lau	\$399
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Lexmark 2030 Color Jetprinter	\$179
Lexmark 7200 Color Jetprinters	\$399
Lexmark Optra E+ Laser printer	\$399
Epson Stylus Color 600	\$269
Epson Stylus Color 800	\$399
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Canon BJC - 250	\$149
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10ft. IEEE-1284 Printer Cable	\$ 16

Communication Options

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2nd and 3rd year next-business-day* on-site service coverage*	\$99
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Other service options may be available, ask your system consultant	

Extended Desktop Service Options

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2nd year on-site service* coverage	\$79
2nd and 3rd year on-site service* coverage	\$99
Other service options may be available, ask your system consultant	

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3Com 3C509B Etherlink III ISA combo network adapter	\$79
3Com 3C905 EtherlinkXL PCI combo network adapter	\$99
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3Com OfficeConnect Switch 140	\$969

Other Options

APC Per7T surge suppressor	\$39
APC Pro7T surge suppressor	\$59
Microsoft Natural Keyboard upgrade from standard keyboard†	\$49

* Requires SCSI host adapter
† Upgrade from systems with standard Micron 17" 17PGs color monitor
* 1st year on-site service is available in the United States and in limited areas in Canada from third-party service providers per customer's agreement with provider
* 2nd year and 3rd year offerings are available in the United States only. Extended services, if purchased after system shipment, may have a higher cost.
* Service will be scheduled whenever possible, for the next business day after parts are received by the customer.
* Available in certain locations. Ask your system consultant for details.
Some options and accessories available with system purchase only.

* Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and observed transfer rates may be less than the maximum potentials.



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First Looks



Multimedia Display, a 15-inch CRT (\$400 street) with Polk Audio speakers that attach to either side of the monitor, and an integrated microphone.

The HP Pavilion 3260 is an incredibly affordable starter machine for a student or family, in spite of its limited expansion and sluggish performance. For basic computing with a bit of Internet thrown in, the Pavilion does the job well.

IBM Consumer Division

IBM Aptiva E26

IBM's Consumer Division may have been late to the subzero party, but—in certain respects—its K6/233-powered Aptiva E26 (\$999 street) is the best dressed of the systems in this roundup, at least in terms of hardware.

The Aptiva E26 is housed in a standard mini-tower case, so it provides more expansion room than the norm for this roundup. Up front, in addition to a floppy disk drive and a 24X CD-ROM drive, there are two empty 5.25-inch drive bays.

Removing the cover to get inside is easy, once you know how to do it; the system manual graphically outlines this process step by step. Just flip the rear-mounted cover lock, depress a release button inside the front of the cover at the bottom of the system, and slide the cover off—

no tools are required.

You'll reap the benefits of having a full-size mini-tower when it comes to expansion space. Although no internal drive bays are available, there are two PCI slot, three ISA slots (one taken by a K56flex modem), and one shared expansion slot. On the system's motherboard, you'll find a 233-MHz K6 processor and ALi chip set; you won't find any L2 cache. Also integrated on the board is a Crystal audio chip set as well as an ATI 3D Rage II+ DVD graphics engine (with 1MB of nonupgradable SGRAM, which means the machine itself can't handle 16-bit color at 1,024-by-768 resolution). Two DIMM

sockets are available for SDRAM; one was occupied in our test configuration.

The IBM Aptiva was a midrange performer on our benchmark tests. Its Winstone, Graphics WinMark, and CPUmark₃₂ scores came in behind Compaq's scores, due to the Aptiva's lack of L2 cache.

One area in which the Aptiva falls short of the competition is bundled software. Though others provide some options for each family member, the IBM unit is geared toward adults. It comes preloaded with Lotus SmartSuite 97 and a host of utilities.

Still, newcomers have an easy time starting up. Clicking on the "Your Aptiva Adven-

ture Starts Here!" icon on the desktop will kick-start the installation of IBM's AntiVirus; the machine then reboots, and you're presented with the company's informational Multimedia Experience video. The Aptiva Adventure install also loads quick-launch icons for Entertainment (ActiveMovie and Audio Station), Aptiva on the Net (which will help you set up your machine to get online and download software updates from the Web), Aptiva Productivity (Lotus programs), and Aptiva Ware (utilities and instructional information).

The Aptiva also ships with a pair of unexciting speakers; sound quality was acceptable but not outstanding. IBM also offers a number of monitor options—we looked at a 15-inch model, which provided the basic display controls but nothing else.

For productivity, the IBM Aptiva E26 is a strong choice, and you won't be stuck down the road if you want to add hardware.

Micron Electronics Inc.

Millennia SE 233

By virtue of sheer performance, Micron's Millennia SE 233 (\$999 direct) is far ahead of the competition. It also comes with loads of room to expand, a





US Robotics

Capable of receiving at up to 56 Kbps and sending at up to 31.2 Kbps. Due to FCC regulations, receiving speeds are limited to 53 Kbps. Actual speeds may vary. Requires compatible phone line and server equipment. Complies with both the proposed ITU 56K standard and x2 technology protocols. Standard officially determined in February 1998; ratification expected in September 1998. See www.3com.com/56k

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New desktop modems and access servers will be available this month, with PC cards coming soon. You'll find a list of dealers where you can buy them on the 3Com Web site. And if you're currently an x2 user with a U.S. Robotics® modem, Megahertz® PC Card or Total Control™ access server, there's information on how you can easily upgrade.

Either way, www.3com.com/56k has everything you need to take advantage of the new standard. Which, coming from the company that connects more people to the Internet than any other, should be no surprise at all.



The U.S. Robotics ITU 56K
standard modem.

The world's first ITU 56K
standard modem.

First Looks

Pentium MMX/233 processor, 32MB of EDO RAM, and—a rarity in this class—512K of secondary processor cache. But if you're looking for a PC bundled with heaps of software, you'll need to look elsewhere: The Millennia comes only with Windows 95.

When you pop open the Micron's tool-free mini-tower case, you'll find an uncluttered interior with plenty of room for upgrades. The 56K x2 modem takes up one ISA slot, while the Diamond Stealth 3D 2000 graphics card fills one PCI slot. This leaves one ISA, one PCI, and one shared slot free. On the front of the case are two available 3.5-inch bays, a 5.25-inch bay along with an open internal 3.5-inch drive.

On the Micron's motherboard sits Intel's 430HX chip set and a Pentium MMX/233 CPU. In spite of the added expense, Micron has included 512K L2 cache, giving your multitasking a real speed boost. The pair of Advent AV009 speakers coupled with the integrated Creative Labs SoundBlaster 16 provide the system's sound.

Earning the top spot in all but two of our benchmark tests, the Micron's fast processor and L2 cache paid off with excellent performance. The Graphics WinMark score came in a close second to the Compaq, and the only blight on the Micron's record was due to the relatively slow Hitachi 16X CD-ROM that earned the Micron the second-lowest CD-ROM WinMark score.

Micron has a minimalist approach with respect to bundled software: Only Windows 95 is preloaded, and no other packages are bundled. You do get a price break, though, on the monitor: For an additional \$200, you

can get the 15-inch (13.7-inch viewable) Micron monitor we tested, which is one of the better bargains in this roundup.

The Micron is a good choice if you're looking for a bare-bones machine with more-than-adequate speed. But if you're a first-time home buyer and are looking for a little bit more in the way of bells, whistles, and software, you'd be better off with another system.

and Suspend buttons.

Getting inside the mini-tower, however, is a puzzling task. First you must remove three gray plastic panels that run along the sides and front of the machine. The next step is not obvious—nor is it documented. In fact, it took us about 10 minutes to figure out how to take the side panel off in order to expose the interior. To do this, you must remove three screws from the bottom of the

CPUmark32 score was the lowest of all systems. Its ZD Business Graphics WinMark score, however, was right in line with the other cacheless machines.

The system's best feature is its bundled, customized software. Packard Bell preloads both its Starter Pack and its Support Pack. The former is for novices and includes the CyberCoach, which takes over your cursor and walks you through lessons on

how to perform such basic functions as recording your own voice, writing a letter, and working with the Windows 95 desktop.

Starter also features the CyberTrio, which lets you work within three different kinds of desktop environments (advanced, basic, and one for kids). The kiddy desktop offers only game selections, and the basic desktop—suitable for older children—provides more

functionality but won't access important system information such as Windows Device Manager.

The Support Pack includes KiddoNet, a fun, friendly, and safe home page designed especially for small children just starting to cruise the Internet. KiddoNet will not only keep your kids on track online, it will also provide Internet-based activities to keep them busy.

You get an impressive array of Microsoft titles, including Encarta, Greetings Workshop, Money, Word, and Works; also loaded are MGI PhotoSuite and Quicken Basic 98. The Navigator Assistant, a final software addition to this machine, gives you single-click access to numerous system functions, including playing an audio CD and using the Internet.

For anyone who has to serve an entire family with one PC, the Packard Bell Multimedia S606 is a terrific choice. **PC**

**Packard Bell
Multimedia S606**
Street price: \$999 with
Pentium MMX/233
CPU, 32MB RAM,
4.3GB hard disk,
20X CD-ROM drive,
56K x2 modem;
Packard Bell
5480 15-inch
monitor: \$349 (street)
Packard Bell NEC Inc.,
Sacramento, CA; 800-735-5666
www.packardbell.com
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Packard Bell NEC

Packard Bell Multimedia S606

If you're a computer novice looking for a great home PC that the entire family can use, check out Packard Bell's Pentium MMX/233 Multimedia S606 system (\$999 street). Packard Bell has gone the extra mile by preloading a customized suite of applications geared toward teaching families about their new systems, showing them how to get on the Internet, and even throwing in two free months of unlimited Internet use via Prodigy. Unfortunately, the machine can be difficult to access, and system documentation is thin.

The Packard Bell S606 is a comparatively spacious mini-tower system. In front are three 5.25-inch drive bays (one occupied by a 20X CD-ROM drive), the floppy disk drive, and Power

machine (the side panel is L-shaped, covering both the side and bottom of the machine); the cover then slides right off.

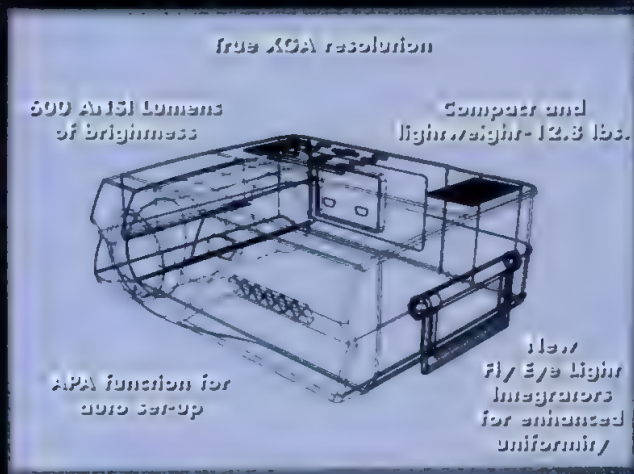
Once inside, you'll discover a 233-MHz Pentium MMX CPU, Intel's 430VX chip set, and two DIMM sockets. As with the HP and IBM machines, the S606 has no L2 cache. The PC has a decent number of expansion slots, including two PCI slots and three ISA slots (one containing a 56K x2 modem), all of which are located on a riser card. Graphics functions for the S606 are taken care of by an integrated S3 Trio64 V2/DX chip set with 2MB of VRAM; audio is handled by an integrated Crystal sound chip.

The fact that the S606 had one of the more powerful processors in our roundup really didn't show on our benchmark tests, because of the lack of L2 cache. As a result, its ZD Business Winstone 98 score tied for last place with the HP Pavilion, and its ZD



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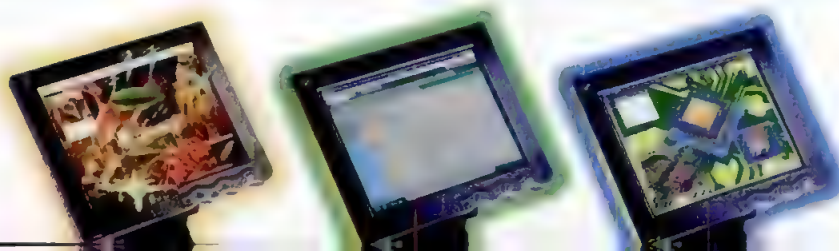
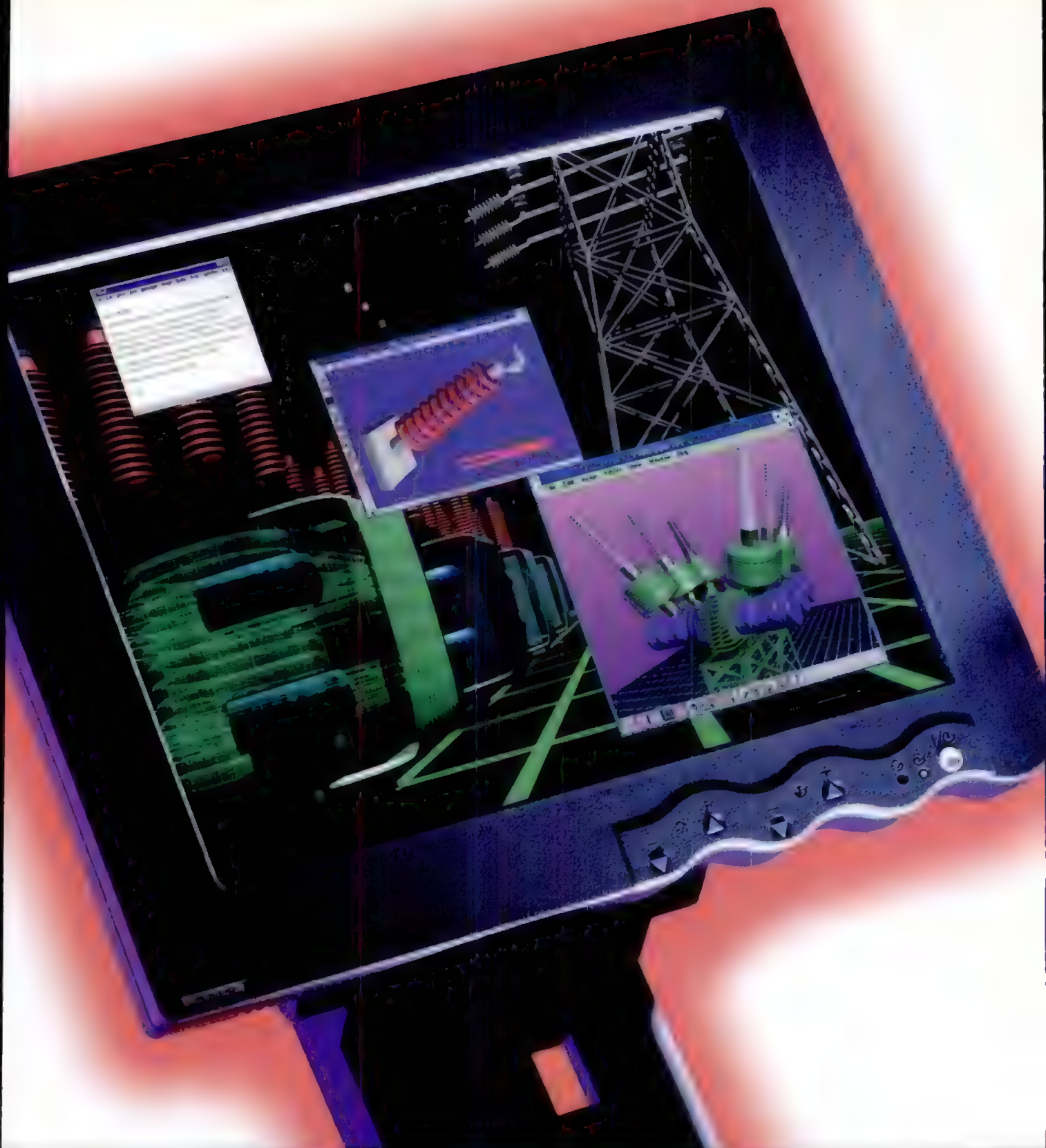


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IBM

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First Looks

CONTACT MANAGERS

Full Contact

GoldMine adds ease of use and more features to the newest version of its eponymous contact manager.

By Greg Alwang

Known for raising the bar on contact management, GoldMine Software has released Version 4.0 of its flagship product, an even more complete business and sales solution. GoldMine 4.0 (\$170 street) provides a unique blend of features geared toward managing your contacts, time, messages, and documents as well as providing high-end sales automation processes.

IMPROVED EASE OF USE

In past upgrades, GoldMine has made incremental strides in improving the usability of this feature-rich yet often overwhelming contact manager. But Version 4.0 provides an excellent balance of power and usability. You will find more-comprehensive manuals as well as new wizards for completing such difficult tasks as mail merges, importing and exporting, and creating databases.

GoldMine includes industry-specific templates complete with merge letters, lookup fields, automated processes, and branching scripts. These templates will help companies jump-start their contact management without considerable time and customization.

The revamped E-mail Center is now graphic and includes a full-blown POP3 e-mail client supporting both GoldMine e-mail and Internet e-mail. Like some standalone e-mail packages, the Center supports multiple accounts, e-mail templates, folders, and rules, and it lets you drag and

drop file attachments from Windows Explorer into a message. Displaying further Web prowess, GoldMine comes with an HTML page and CGI script that you can use to gather new contact records automatically as visitors submit forms on your Web site.

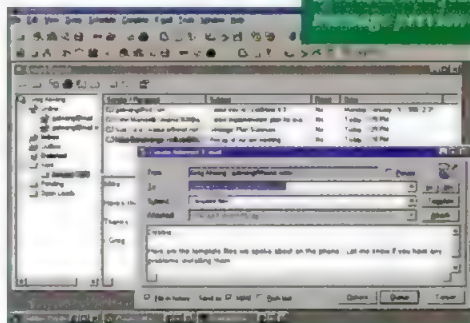
What's unchanged is GoldMine's tab-based contact screen. You can add custom tabs as needed, and the profile feature allows you to add groups of categorized fields to specific contacts. When tracking additional contacts for an organization, you can now include a host of supplemental information, such as Web sites and e-mail addresses.

WORKGROUPS

GoldMine has always excelled at workgroup features. Added to the already impressive scheduling features are recurring holidays and to-do actions that you simply check off when completed. You can view multiple users' schedules and locate times when they're free. Keeping daily tasks at your fingertips, the Activity List gives you an at-a-glance tabbed view of all your open to-dos, calls, appointments, e-mails, and forecasted sales.

TAKING IT ON THE ROAD

For mobile sales teams, the Synchronization Wizard walks you through replicating changes with other sites and remote users via LAN, WAN, Internet e-mail, modem, and (new to this version) IP-to-IP. This adds flexibility for growing busi-



nesses or those with a variety of connection types in the field. Unlike contact managers, GoldMine's field-level synchronization transfers deletions, data-structure changes, and security settings, so you won't have to worry about periodically sending full database updates to remote users. In addition, you can set up synchronization profiles to allow remote users a "one-button sync" option.

GoldMine is replete with features that make it a genuine sales tool. It lets you forecast sales and analyze performance via booked and closed sales. For distributed sales forces, a new Territory Realignment Wizard walks you through reassigning and transferring contacts and scheduled activities from one user to another.

The new Opportunity Manager lets you track all the related contacts and progress for large sales on a project basis. It's ideal for mapping out strategies and actions to manage complex sales efforts. If you want to track projects unrelated to sales, the Project Manager mode lets you lay

out project tasks, details, and team members on a color-coded timeline.

GoldMine has been rewritten as a true multithreaded 32-bit application. You can open any number of windows or run many processes simultaneously without any noticeable

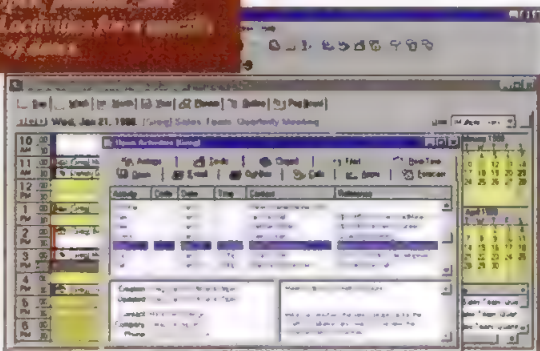
degradation in performance. This also allows GoldMine's automated processes or agents to run continuously in the background, listening for events that trigger such things as scheduled follow-ups, e-mails, or merge letters.

JAVA IS BREWING

The upcoming Java version of GoldMine (scheduled for release later this year) will be based on this new platform and offer users access to contacts, calendars, activities and e-mail all from a Web browser. The Java client's architecture will include a 300K Java client, an object-based GoldMine NetServer, and the GoldMine database file server. The Java client uses 128-bit encryption and a proprietary protocol, providing a secure environment.

GoldMine is not only faster, but also lends itself to scalability. GoldMine 4.0 Client/Server Edition (\$1,295 list), has native driver support for various host systems including MS SQL, Oracle, Informix, Interbase, and Sybase and lets you easily upscale your contact database to these formats using a New Database Wizard. **GoldMine 4.0, Standard Edition.** Street price: \$170 (single user) (\$70 after \$100 competitive upgrade rebate), \$695 five-user network version. Requires: 486SX or higher CPU, 16MB RAM, 25MB disk space, Microsoft Windows 95 or NT 4.0. Goldmine Software, Pacific Palisades, CA; 800-654-3526, 310-454-6800. www.goldminesw.com. Choose 402 at www.pcmag.com/infolink.

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Digital_Nervous_System:
intelligent evolution





What is a Digital_Nervous_System?

In the beginning, you had to figure out how to make a bunch of disparate pieces work together.

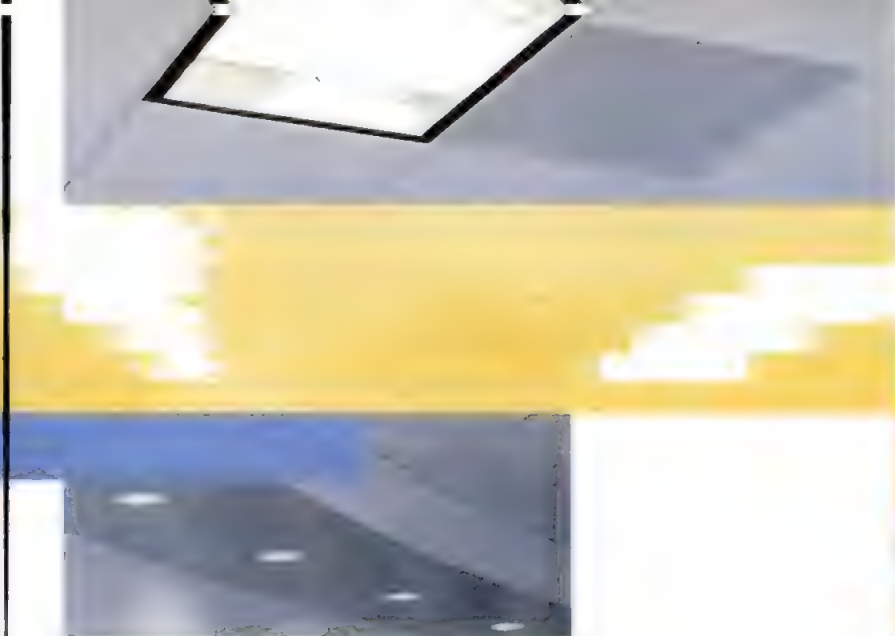
That was the fun and the challenge and the job. Making parts work together. Making technology work.

That's what has always intrigued and challenged us, too. Just a few years ago, it was a breakthrough to be able to drop spreadsheet figures into a Word document. Now, with the explosion of the Internet and advances in chip speed and software functionality, it's things like accessing real-time figures in a database from a laptop thousands of miles away. Or doing collaborative work across three countries via an Intranet.

The time has come when you can build pretty much any kind of technology system you want, to do anything your company needs to do. When that technology system lets everyone in your company harness and share information freely, we call it a Digital_Nervous_System.

With a Digital_Nervous_System, the best thinking can happen at all levels. Data becomes knowledge. And knowledge becomes an advantage.

A Digital_Nervous_System relies on distributed PCs and integrated software to make information flow more rich, rapid and accurate. It helps everyone act faster and make more informed decisions. It prepares your company to react to unplanned events. It helps close the gap between your company and its customers. And it lets people focus on business, not technology.



What's in a Digital_Nervous_System? Up-to-date PCs. Universal e-mail (encompassing overseas offices, clients and vendors). Common productivity software (word processors, spreadsheets, etc.). Business-specific applications (either off-the-shelf or custom-built). And integration with the Internet.

You may have most or all of these things now. But a Digital_Nervous_System is more than just parts—it's how these parts relate to each other. How they're integrated.

And at its heart is software that acts alike, works alike, thinks alike.

Naturally, we believe our software provides the best foundation for a Digital_Nervous_System. We built Microsoft® Windows®, Office, BackOffice® and Visual Studio™ from the ground up to work together in the same familiar way. To provide the greatest level of software integration possible.

They also work with an industry's worth of applications, so incorporating new software solutions is easier. Taking advantage of hardware advances is easier, too. Integrating Internet capabilities is easier. Managing all the pieces is easier. Managing change is easier.

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First Looks

ILLUSTRATION SOFTWARE

Digital Drawing Board

CorelDraw 8's suite of graphics applications brings new tools and a new interface to a familiar package.

By Luisa Simone

CorelDraw has established itself as the top Windows-based illustration program by offering more tools, more special effects, and more bundled software than any of its competitors. The latest release—CorelDraw 8 (\$695 list), which comes with Photo-Paint 8—continues this tradition. CorelDraw 8 also revamps the interface and tweaks the core drawing tools for greater productivity.

CORELDRAW 8

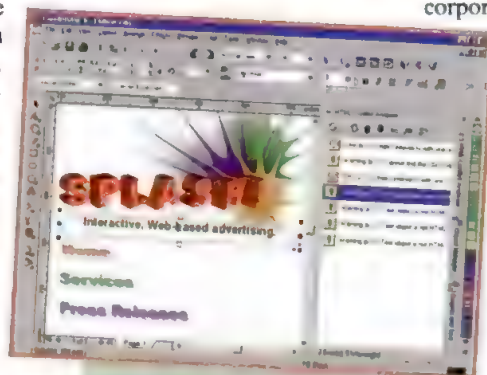
The new flat-look interface of CorelDraw is now completely configurable. A single dialog box lets you create and save custom interface profiles. For example, you can display different toolbars and rollups depending on whether you are designing for print or the Web. Draw 8 has also moved key document-management functions (such as object properties, layers, and defined styles) to Docker windows. These palettes snap to the edge of the workspace and collapse down to the size of a tab when not in use.

NEW TOOLS

Draw 8 boasts a number of new interactive tools. To some extent, this too is an interface improvement. The new Interactive Extrude, Interactive Blend, and Interactive Envelope tools don't offer new functions, but they do provide better access to existing functions. For example, the Interactive Envelope tool duplicates the Envelope Roll-Up function (which is still available). But this more elegant implementation allows you to manipulate an object in the

workspace and choose options from the property bar.

Two of the interactive tools, however, do add new special effects to the program. The Inter-



MEDIATE: The HTML Conflict Analyzer appears in a Docker window along the edge of the workspace and alerts you to possible HTML errors.

active Drop Shadow tool lets you dynamically reposition a photorealistic shadow (complete with feathered edges and transparency) that mimics the shape of a selected object. And the Interactive Distortion tool, which is similar to the distortion filters introduced by Adobe Illustrator, can push or pull the nodes of a selected curve, create jagged edges, or twist nodes around a central rotation point. Even after you've distorted an object, you can change the parameters or undo the effects.

Separate from the vector-based extrusion function, the new Extrude Text command invokes an integrated 3-D modeling program. You must first create the text object and assign a font and fill color using Draw's standard tools. The modeling program then lets you specify the depth of the extrusion, adjust light sources, pan and zoom the camera, and rotate the letters in 3-D space.

When you render the scene, you are actually generating a bitmapped image. This approach has several shortcomings, though. For one thing, the text is no longer editable. Also, relying on a bitmap representation requires the designer to specify the correct output resolution and to manage the resource demands that bitmapped images make when they are incorporated into a drawing.

Long-time users will appreciate the seemingly small improvements that make Draw 8 more efficient. Whenever the pick or the drawing tools are positioned over a node, they immediately switch to the Shape tool, allowing you to draw and edit curves fluidly. Guidelines are now treated as objects, making it possible to select multiple guides and move—or even rotate—them to a new position.

The Knife tool can make straight-edge or free-form cuts. The Digger function lets you se-

lect objects hidden in a stack by holding down the Alt key. A simple command can automatically adjust the point size of text to fit the frame. And you can embed graphics into paragraph text (much like a DTP program) to have a picture reflow with its associated copy.

WEB TOOLS

This version of CorelDraw lets Web designers add interactive objects to a page in the form of buttons, text boxes, and scrollable lists. When viewed in a Web browser, these objects are live and allow a reader to select items or enter text. But Corel does not provide the CGI scripts necessary to make these objects fully functional. And the cursory documentation assumes a level of expertise with behavioral properties and data processing values that most designers simply do not possess.

In addition, two functions that promise to help designers create HTML-compliant documents delivered mixed results. The command that should make a text frame HTML-compatible did prevent us from rotating the

The Swiss Army Knife of

CorelDraw 8 ships with a powerful and wide-ranging collection of ancillary programs and utilities. These tools can help you work more efficiently in a production environment or help you explore new realms of artistic expression.

CorelDream 3D 8 is a modeling and rendering program that employs a wizard to create 3-D scenes. Version 8 lets you export the 3DMF file format from Dream 3D into either Draw or Photo-Paint, where a built-in rendering engine lets you rotate, zoom, pan, and light the object before you incorporate it into a document as a bitmapped image.

With Corel Texture, you can specify material properties and lighting effects to generate complex, naturalistic patterns, such as clouds or marble. We particularly liked the ability to create patterns automatically that are "in repeat" for use as seamless Web page backgrounds.

Corel OCR Trace 8 converts scanned images to vector drawings or editable text. Processing tools can clean up stray pixels or reduce the colors of a scanned image to trace images more accurately. And CorelScan employs a wizard to help you determine the correct resolution and color-depth settings for your scanner. Automated pre- and postprocessing rou-

SPECIAL EFFECTS:

The colorful accents in this photo montage are the result of lens effects.

frame, but it did not prevent us from assigning nonstandard fonts and point sizes to the copy. And even though the HTML Conflict Analyzer alerted us to non-HTML-compliant text, it failed to identify overlapping objects on the Internet layer with any consistency.

Web publishers now have a wizard to help them generate HTML documents from CorelDraw. For example, you can choose between frame-based HTML or cascading style sheets and GIF or JPEG picture formats. But this version of Draw does little to compete with Macromedia Freehand's approach to Web publishing, which includes the widely accepted Shockwave format and Flash animations. Corel's proprietary Barista format is still suitable only for intranet publishing (where the necessary Java classes can be centrally stored).

Graphics Programs

tines can remove artifacts from photographs (such as red eye) or those generated by the scanning process (such as moiré patterns).

And that's just the beginning. You can create snapshots of your screen with Corel Capture, customize or extend the functionality of Draw or Photo-Paint with the OLE-2 au-

COREL PHOTO-PAINT 8

The same customizable interface and Docker panels found in CorelDraw 8 are put to work in Corel Photo-Paint 8. Photo-Paint 7 won the Editors' Choice award in our last roundup of image-editing software ("The PC Palette," April 22, 1997). A number of new painting tools make this version even stronger.

The Image Sprayer tool lets you paint with a series of pictures, giving you control over size, randomness, and dab interval. We were particularly impressed with two new painting modes: Brush Symmetry and Orbits, which can be used with any of Photo-Paint's brushes. As the name implies, Symmetry mirrors a brushstroke in any direction—vertically, horizontally, or radi-

ally. Orbits transform a brush nib into a series of points that form a pattern. Unlike a static picture, however, an orbit changes dynamically as you paint. So you can create a curly telephone cord or muscle sinew with one stroke.

Like CorelDraw, Photo-Paint can apply special effects to a specific area of a picture via a lens. Lenses are treated as separate objects that can be moved, resized, and reshaped. The interactive drop shadow can apply

judge the effects of color reduction or compression before you save the image.

The one weak spot in the program proved to be the enhanced GIF animation export, which allows you to specify frame rate and save only the differences between frames (in order to produce smaller files). We found that playback speed is still largely determined by the dimensions of the GIF file, making the frame-rate control marginally useful. And saving only the deltas (or differences) between the animation frames often corrupted the file.

Traditional publishers will be pleased with the improved print options available in both Draw and Photo-Paint. The programs provide extensive print previews, create custom impositions (the arrangement of images or pages on a large sheet of paper), and

take advantage of the Kodak ColorSync CMS (which relies on standard ICC profiles to match colors across input and output devices).

During our testing, Draw and Photo-Paint printed most of our test images to a PostScript Level 2 device without a hitch. Nevertheless, overlapping a rendered 3-D text object with other internally generated bitmaps produced artifacts in the printout. But it is the new support of PostScript Level 3—with its superior handling of clipping paths and gradients—that promises to produce cleaner output and improve Corel's reputation with service bureaus.

CorelDraw 8. List price: \$695 (\$249 upgrade). Requires: Pentium/90-based PC or higher, 16MB RAM, 80MB hard disk space, SVGA monitor, Microsoft Windows 95 or NT 4.0. Corel Corp., Ottawa, Canada; 800-772-6735, 613-728-3733; fax, 613-761-176; www.corel.com. Choose 407 at www.pcmag.com/infolink.

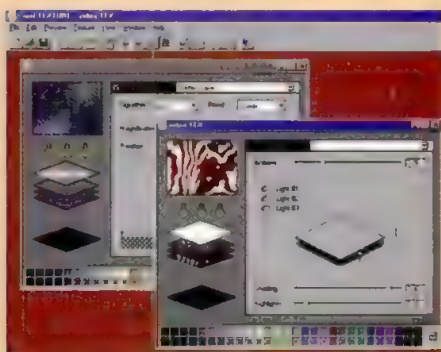
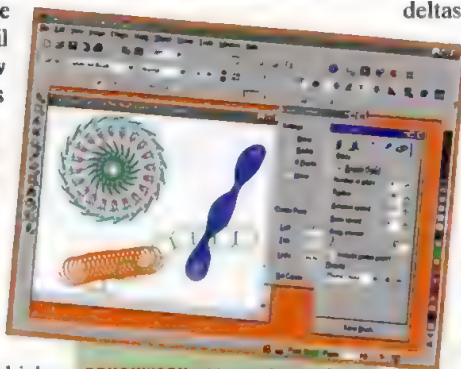
BRUSHWORK: The Orbits and Symmetry painting modes let you create complex patterned brushstrokes and mandala-mirrored images.

both flat and perspective shadows. In addition to recognizing soft edges and transparency, you can determine the angle at which the light source strikes the object casting a shadow.

Photo-Paint lets you create panoramic views by stitching together two or more images. On our testing, the automatic positioning was typically correct. But if it isn't accurate, you must manually move the previews in the dialog box, where they are so small you can't properly judge the alignment.

OUTPUT

Photo-Paint 8 improves on its already robust Web-image output. This version can import and export the PNG and FlashPix formats. Even if you are exporting standard GIF and JPEG images, you'll appreciate the new smoothing options and interactive previews that allow you to



TOUCHY: Corel Texture uses a layer metaphor to build up complex patterns.

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take on the world.



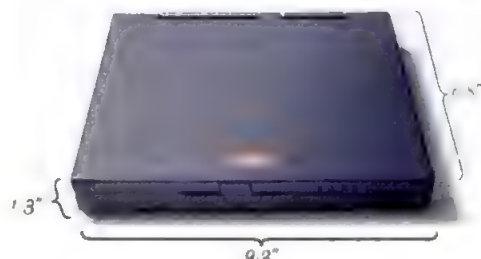
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First Looks

PERIPHERALS

Surround Sound

Shark Multimedia's Predator 3D audio card helps take 3-D sound to new directions.

By Will Fastie

Shark Multimedia makes no bones about it: The company has designed its new Predator sound cards as competitors in the SoundBlaster Pro-compatible games market. Shark's claim for its product has teeth: The Predator 3D (\$99.95 list) delivers.

The Predator's excellent installation card makes up for the lack of either a print or CD-ROM manual. The card has a clearly labeled photograph of the ISA card we tested (a PCI Windows 95-only version should be available by the time you read this), with pointers and captions for all the significant parts. It also features illustrated, step-by-step instructions for installation. Connecting the CD audio cable is

also easy, because the connector is set apart on the card and is clearly marked.

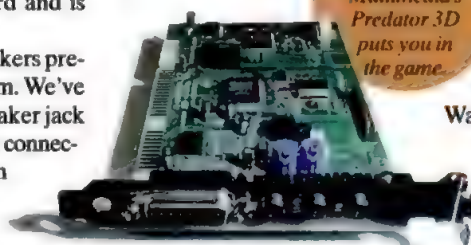
Connecting the speakers presented the only problem. We've come to expect the speaker jack to be next to the joystick connector, but despite the claim of SoundBlaster compatibility, the Predator's jack is the middle of three. (In keeping with more contemporary audio cards, it doesn't provide line-out.)

Since the Predator is a plug-and-play card, Windows 95 installation was a breeze. On our test system, we needed to alternate between the Predator and Windows 95 CDs to get all the pieces, but the process was smooth and easy to understand.

Properly configuring the sys-

tem for 3-D sound requires an extra step: installing Microsoft DirectX 5.0 or higher. Our test PC featured Version 4, so we had to install the update from the Predator CD.

Shark's 3-D demos (provided by Aureal



SOUND INVESTMENT:
Shark Multimedia's Predator 3D puts you in the game.

Semiconductor and written by InWorld VR) show off what 3-D sound can do. In each of the demos, an object moves around in a 3-D space making noise, and you can adjust your position within that space. As with all 3-D sound cards, your software must support the effects. Aureal maintains a Web site (www.a3d.com) that lists titles supporting its 3-D technology.

The Predator uses two chips, both from Analog Devices: the ADSP-2181 digital signal processor and the AD-1816 audio chip.

The product supports 32 voices, but it provides only a general MIDI instrument and percussion on one channel, which keeps it out of the professional music category. An optional hardware upgrade provides a WaveBlaster-compatible wavetable. Our tests with a variety of programs, including Quake configured for SoundBlaster, were all successful. The Predator is a good choice for gamers looking for a 3-D upgrade.

Predator 3D. List price: \$99.95. Requires: Pentium/133 or better, 16MB RAM, 10MB disk space, Microsoft Windows 95 or NT 4.0 (some limited capabilities), VGA video or better, ISA slot. Shark Multimedia Inc., Santa Clara, CA; 800-800-3321, 408-987-5400; www.sharkmm.com. Choose 405 at www.pcmag.com/infolink.

UTILITIES

Fast Cache

CD-Quick Cache improves the performance of even the fastest CD-ROM drives.

By Sheryl Canter

CD-ROM drives keep spinning faster and faster. It wasn't very long ago that quad-speed (4X) drives were the latest marvel. Now 24X drives are commonplace. Does this mean that CD-ROM drives no longer need caching? In reality, the speed at which the platter spins—a.k.a. the "data transfer rate"—is only one factor in CD-ROM drive speed. Even a 24X CD-ROM drive can benefit from a cache. Microsoft Windows 95 includes a built-in cache, but you will get much better performance with CD-Quick Cache for Windows 95, Version 3.0, from Circuit Systems (\$29 shareware).

CD-Quick Cache's CD-Test utility lets you measure performance improvement by timing directory walks, sequential reads, and random reads. We tested the Microsoft Cinemania

cent improvement.

This newest version adds two main features: persistent cache storage that can track up to 256 different CD-ROMs and intelligent video caching that lets you control the cache size for .AVI, QuickTime, and MPEG files.

The bottleneck in reading CD-ROMs is caused by the access time (the time it takes for the read head to be positioned). Typical hard disk access time is 10 ms; access time for a CD-ROM drive is 100 ms or higher. CD-ROM access speed can't be improved much beyond this because of physical limitations, but a cache can reduce the number of necessary reads.

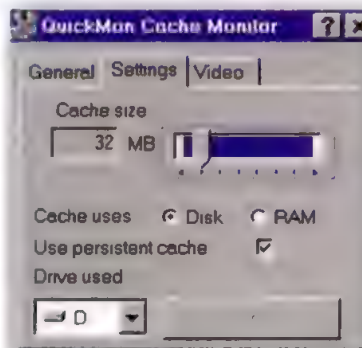
Caches make educated guesses about which data you will want to read next and store that data on media with quicker access than CD-ROMs. CD-Quick Cache can place the cache either

on the hard disk or in memory.

Cache utilities use various techniques to guess which data you will want next, but all of them cache the data you request from the device, since it's likely you will want that data again. CD-Quick Cache uses a dynamic read-ahead method that monitors the randomness of your access and adjusts read-ahead buffering accordingly.

CD-Quick Cache for Windows 3.1 won the 1995 *PC Magazine* Shareware Awards. The Windows 95 version was the 1996 winner in the System Tools category, and this latest version is a worthy successor.

CD-Quick Cache for Windows 95, Version 3.0. List price: \$29 (shareware). Requires: Microsoft Windows 95, CD-ROM drive with a 32-bit protected-mode driver. Circuit Systems Inc., Sicklerville, NJ; 800-242-4775, 609-875-5433; ourworld.compuserve.com/homepages/circuitsys. Choose 406 at www.pcmag.com/infolink.



INSTANT ACCESS: CD-Quick Cache lets you choose whether to store the cache in memory or on your hard disk.

97 CD-ROM using the default settings and a hard disk cache. The total time for the tests was 89.1 seconds without CD-Quick Cache and 29.0 seconds with CD-Quick Cache—a 300 per-



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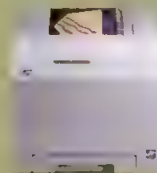


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First Looks

DATABASES

A Jolt of Java

Oracle's small-footprint database now offers strong Java support and enhanced replication abilities.

By Jim Lynch

In many programming circles, Java has become the Holy Grail of application development. Oracle Lite 3.0—formerly known as Personal Oracle Lite—is poised to take advantage of this belief with new Java programming tools. Oracle has added a number of important features to Oracle Lite (\$100 street per user, \$300 street per developer), including an enhanced Java programming interface and increased replication functionality.

Oracle Lite comes with Oracle Navigator, an easy-to-use GUI-based database management tool that allows you to delve quickly into the details of your database. Using the Navigator, you can create, delete, move, view, and change database objects.

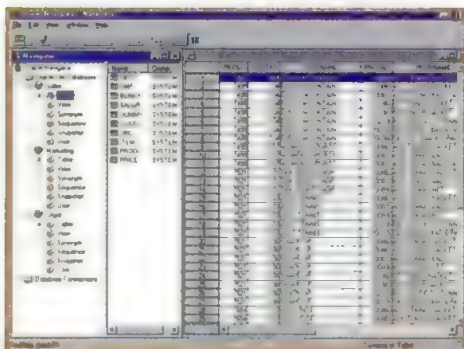
JDBC ACCESS

Native Java Database Connectivity (JDBC) is now included in Oracle Lite, allowing Java applications to communicate directly with Oracle Lite's database engine. The new JDBC access also means that Oracle Lite is one step ahead of its big brother, Oracle8, which most likely will not have native Java connectivity until Version 8.1.

JDBC gives Oracle Lite 3.0 a performance advantage over regular JDBC-ODBC bridge implementations, which require the application to move through two or three layers to query and store information in the database. This also gives Java developers some new features to play with, such as object inheritance.

PERFORMANCE BOOST

Java objects can now be easily stored via Oracle Lite's Java Access Classes. Using these classes will provide better perfor-



NAVIGATOR TOOL: You can Oracle Lite's Navigator to create, delete, move, and change database objects.

mance, since they support transactions and queries without needing to move through the relational layer. This is a step up from the use of a relational layer to provide transaction capability. It's also a strong incentive for programmers to use the new classes. Keep in mind that in order to take advantage of the new Java features, you'll need to have at least Version 1.1.3 of Sun Microsystems' Java Development Kit.

Oracle Lite also now supports Java implementations of basic database programming features, such as stored procedures and triggers. These tools allow programmers to change data within the database without having to put the programming logic into every program that uses the database.

SYNCHRONIZE AND REPLICATE

Synchronizing client databases with larger corporate databases is also much easier. Oracle Lite can be synchronized with Ora-

cle7 and Oracle8 databases with just a few mouse clicks, making it extremely useful for companies with many remote users.

Oracle Lite's new replication capabilities (faster replication and improved error handling, for example) are also found in Oracle8. Features include support for subquery subsetting, which gives you the ability to define subsets of your database that are needed by remote users. This functionality allows programmers to fine-tune the information that remote users get when replicating, thus reducing the complexity of distributed application development.

Users will now be able to perform wireless bidirectional replication using Oracle Mobile Agents technologies or SQL*Net. Oracle Lite also offers the ability to perform bidirectional replication using different communication transports, including Internet and file-based replication.

Anyone who can browse the Internet can now replicate information. When replicating via the Internet, Oracle Lite com-

to the central server. This allows developers a maximum amount of flexibility in defining the communication method. File transfer methods include MAPI and FTP; you can also simply place the file on a disk and carry it to the server.

LIMITED COMPATIBILITY

There are some drawbacks to Oracle Lite's replication abilities. For example, you can exchange data only with Oracle7 and Oracle8 databases, not with other Oracle Lite users. Even though remote users might be in the same room together, they can only exchange data through the central servers—potentially annoying for two users who must quickly exchange data.

Another problem with Oracle Lite is that you must be running Microsoft Windows 95 or Windows NT to use it. DOS, OS/2, and Windows 3.1 users are out of luck and won't be able to take advantage of Oracle Lite's new capabilities. If you use one of the unsupported platforms, Sybase's SQL Anywhere is a possibility to consider, because it offers a broader range of platforms and a multiuser database engine. SQL Anywhere, however, lacks the Java capabilities found in Oracle Lite.

Oracle Lite's new Java functionality and enhanced replication features make it a good bet for companies already using Oracle7 with Windows 95 and Windows NT clients. It's also a good bet for companies using or planning to use Oracle8.

Oracle Lite 3.0. Street price: \$100 per user and \$300 per developer. Requires: 386-based PC or better, 1MB RAM, 2.5MB hard disk space, Microsoft Windows 95 or NT 3.51 or higher. Oracle Corp., Redwood Shores, CA; 650-506-7000, 800-672-2531; www.oracle.com. Choose 401 at www.pcmag.com/infolink.



JDBC: Oracle Lite now includes native JDBC support, which allows a Java application to communicate directly with its database engine.

municates with the client application via HTTP, then with a Web application server, and finally with an enterprise server running Oracle7 or Oracle8.

Changes to the Oracle Lite database can also be copied to a file, which can then be moved



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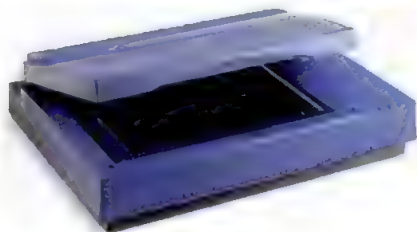
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Total PCI Slots	6	6
Ethernet	10Base-T	10/100Base-T
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First Looks

COMPUTER TELEPHONY DEVICES

PC Phone Home

Mitel Personal Assistant defines a new level of integration of the telephone with the PC.

By Barry Simon

We've been excited for some time about the potential of TAPI and Unimodem/V to allow rich integration of the telephone with the PC. Mitel Personal Assistant (\$300 street), aimed squarely at the SOHO market, is the first package to come close to the promise of this potential.

Mitel Personal Assistant comes with a telephone (a modem is included) and well-integrated software. The unit looks like a fancy telephone, with ten function keys and a speaker volume control in addition to a standard keypad. Underneath, there is a single-line phone connector (which can support up to three incoming numbers with distinctive rings) and a serial cable attachment that you connect to your PC. The vendor promises a USB version of the product with the release of Windows 98.

MANAGING YOUR CALLS

All the magic comes from the links between the phone and the software. If a call comes in and you have Caller ID, the number (and the caller's name, if the number is in your database) will float above your Microsoft Windows notification area. If you prefer, the program can pop up the contact record of the caller.

If you aren't in or if you choose to send the caller to voice mail, the software acts as a fairly sophisticated answering machine. It allows remote-message playback and prompts you with the number of messages you have. If you put a caller on hold,

you can play music to the caller or have the phone periodically remind you that you have someone on hold. The program ships



with a variety of .WAV files for messages and background music. You can also use your own .WAV files or record them using a Windows microphone, the speakerphone, or the phone handset.

The true wizardry of having the power of a computer behind your phone comes in letting you record one-time messages or greetings on a caller-specific basis. Using Caller ID, you can actually have the program greet callers by name. The function keys on the telephone can be programmed to do computer-specific actions, such as pop up your voice mailbox or do specific speed dials.

AUTOMATED DIALING

Another great feature is what the program calls dialers—telephone actions you can program to be issued sequentially as you hit the Spacebar. For example,

to get your bank balance, you may need to dial an 800 number, enter the number 1 twice, type in a nine-digit account number, and then (after a prompt) enter the last digits of your social security number. Once you've programmed it as a dialer, you need only hit the Spacebar a few times.

Included inside the phone is a fax modem chip that allows fax/data calls up to 33.6 Kbps.

The phone is smart enough to sense whether an incoming call is a fax to be routed to the fax software or a voice call to be sent to the answering machine.

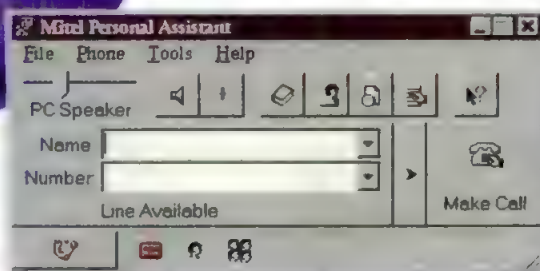
Without either the computer or power, the phone can still make and send calls. With power but with-

Pacific CommWare's TurboCom/95 Pro (www.turbocom.com) let DOS programs use the modem, although again, you will need to exit and restart the Mitel software.

The contact manager in this product doesn't pretend to be a full-fledged PIM. This makes it essential that the vendor develop some way to communicate with the leading PIMs, so you can keep all your contacts in one place. We would have also preferred that phone messages be placed in our MAPI message store.

PLAYING MESSAGES

Since your messages are stored on a PC, you can play them back in any order and fast-forward through the ones you don't need. If the caller's phone number is blocked, you can still right click



YOUR CALL: The Mitel Personal Assistant's simple interface is the front end for a great deal of capability.

and choose to return the call. It would be helpful if the program let you annotate messages so that when you returned to them a day later, you could know which message was which. And for times when

phone numbers are blocked or for situations where the return number is different than the incoming number, it would be useful to be able to edit the incoming phone number.

out the computer, you have hold and speakerphone capabilities. But the bulk of the features require the Mitel software to be running. This software is TAPI compliant, so it can share the modem with other TAPI programs, such as Microsoft Outlook.

Although the product requires Windows 95, if you use programs written for Windows 3.1 you'll need to exit the Mitel software before you use the modem and restart afterward. Otherwise, you'll be left without your answering machine. The Mitel modem does not work with DOS programs, even those running over Windows. Nevertheless, we found that the virtual modem drivers that come with

In spite of a few missing features, this is a great product for anyone who wants to add high-end telephony capabilities to their PC.

Mitel Personal Assistant. Street price: \$300. Requires: Pentium/90-based PC or better, 16MB RAM, 40MB hard disk space, Microsoft Windows 95, CD-ROM drive, sound card, free serial port. Mitel Corp., Kanata, Ontario, Canada; 800-648-3579, 613-592-2122; www.mitel.com/mpa. Choose 400 at www.pcmag.com/infolink.



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First Looks

VOICE-RECOGNITION SOFTWARE

ViaVoice Takes Orders

IBM adds command and control and navigational features to its impressive speech-recognition program.

By Bruce Brown

ViaVoice Gold 4.3 (\$149 list) is the premium version of IBM's trainable voice-recognition product, ViaVoice (still available for \$99 list). Bundled with a headset microphone, ViaVoice Gold uses the same voice-recognition engine and shares all the features of the earlier version (reviewed in "Watch What You Say," March 10, 1998). But by adding desktop navigation and extensive program control, ViaVoice Gold makes it easier to use speech recognition with Windows applications.

As with ViaVoice, the Gold version requires time and patience to train the recognizer for

efficient dictation, but the command mode works well, even with the minimum six-word training set. With continued training and vocabulary expansion, ViaVoice Gold should be a great help for dictation.

The new command and control features let you open, close, and switch between programs by name (or macro). Within programs, you can activate and choose menu items, move the cursor, cut and paste text, and perform many keyboard actions. ViaVoice Gold's installation can put a Dictation item on the Microsoft Word menu bar, so you can dictate directly into Word. A dictation transfer utility lets you

move already-recognized text into Windows applications, but the Gold version enables direct dictation into most Windows 95 or NT programs. ViaVoice Direct is easy to use, requiring only that you open the target application and place the cursor where you want the text to be before starting the dictation program.

One of the best features of ViaVoice Gold is self-actuated online help. Whenever you wonder how you can use ViaVoice Gold, you simply say, "What can I say?" A window then pops up with a list of acceptable commands in outline format.

ViaVoice Gold may be the solution if you want to try continuous speech recognition but aren't sure if the time required will reward you with more efficient text entry. With its command and con-

SAY WHAT?
ViaVoice Gold's VoiceCenter responds to "What can I say?" with a list of acceptable commands.

control and navigation features, ViaVoice Gold provides immediate convenience while you train the recognizer for dictation tasks.

ViaVoice Gold. List price: \$149. Requires: Pentium/166- or Pentium MMX/150-based PC or better, 32MB RAM (48MB for Windows NT), 125MB hard disk space, Sound Blaster 16-compatible or Mwave sound card, Windows 95 or NT 4.0. IBM Corp., Armonk, NY; 800-825-5263, 914-499-1900. www.ibm.com/viavoice. Choose 403 at www.pcmag.com/infolink.

TIME-TRACKING SOFTWARE

Digital Big Brother

HourTrack 98 will keep a close eye on how your employees are spending their time.

By David Haskin

Tracking the comings and goings of employees is a constant headache for small and medium-size organizations. HourTrack 98 (\$100 street for ten employees) is a sophisticated digital punch-clock system that tracks not only how long employees work but also how long they spend on specific jobs.

Administrators can use HourTrack's server-based administration module to create employee records. They can assign each employee to a department and to jobs, which can refer to either a position title or specific projects. Other information in an employee's record can include salary and allowed vacation, sick, and personal time.

Another server-based module enables administrators to

create employee schedules manually or to create schedule templates. Using a dialog box, they can then assign shifts to multiple employees.

Employees load the Entry ID module from their local networked PCs, select their names from a list, and (optionally) choose their departments and jobs. They then click a button to clock in or out. Employees can use passwords, but HourTrack also works with proprietary badge and fingerprint readers. From the Entry ID module, employees can view their schedules, the hours they've worked during the current pay period, and a list of everyone who's currently clocked in. Administrators can leave messages

ON FILE: You create records for each employee in the HourTrack's server-based administration application.

for individual employees or members of specific departments that appear on screen at the next clock-in or clock-out.

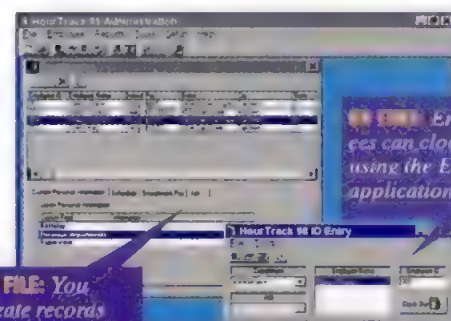
With 30 precreated reports (including billing and payroll) and the ability to allow employees to log in and out of projects, HourTrack makes it easy to determine how much to bill clients. Unfortunately, you cannot create your own reports, which would be handy, say, for examining activities on behalf of specific clients.

You can export reports to popular formats like Microsoft Excel or Word and HTML and to such database formats as Access or

dBase. Also, if you use the national payroll services company Paychex, you can export payroll information directly into a Paychex-compatible file.

HourTrack 98 is simple to use and thorough, but there are a few minor rough edges. The administration module, for instance, doesn't check for

such errors as mistyped Social Security numbers. We also occasionally received indecipherable error messages in the Administration module, such as "13 Type Mismatches." Nevertheless, HourTrack 98 does provide a strong set of tools to help businesses efficiently track employees and the tasks they perform. **HourTrack 98.** Street price: \$100 for ten employees. Requires: 486-based PC or better, 8MB RAM, 25MB hard disk space, Microsoft Windows 95 or NT. Vitrix Inc., Phoenix, AZ; 800-561-6366, 602-955-6366; www.vitrix.com. Choose 404 at www.pcmag.com/infolink.



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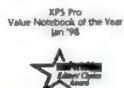
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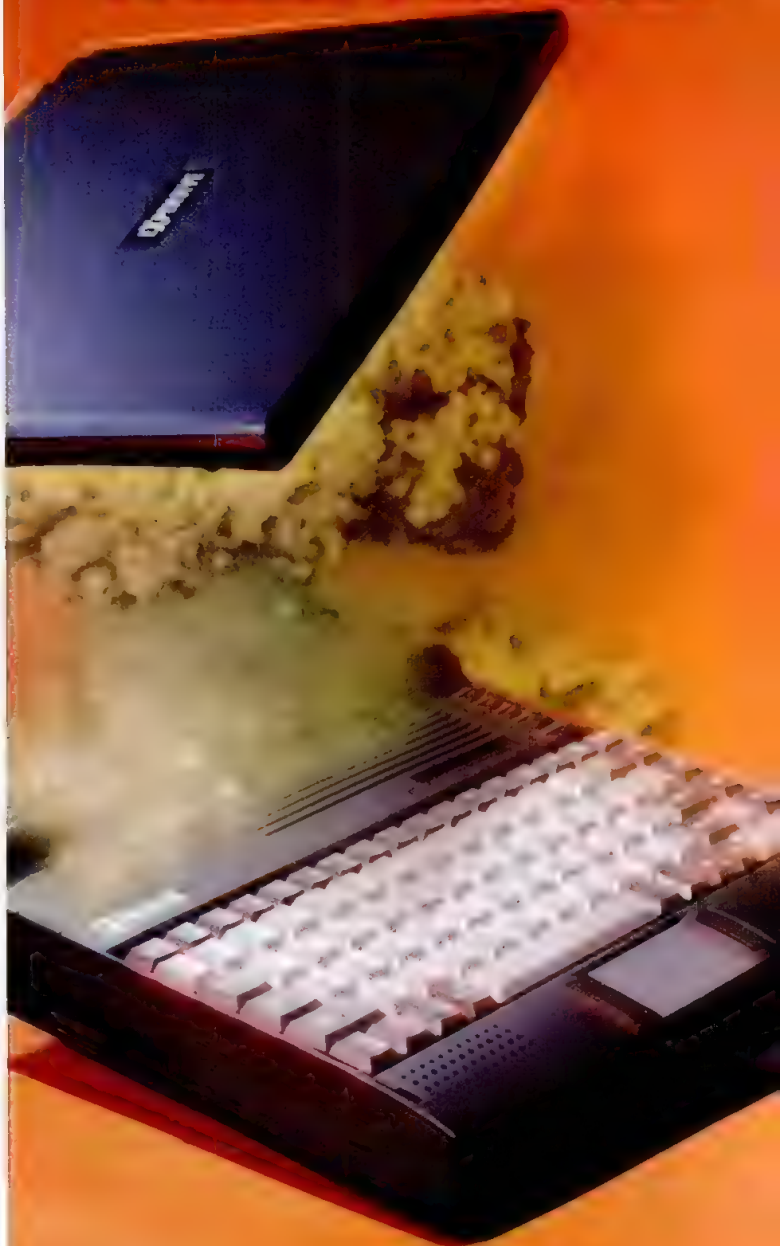
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Second Looks

DAY-TIMER ORGANIZER 98

PIM Improvements

By Nancy Hirsch

A perennial favorite in the PIM category, Day-Timer Organizer 98 received our Editors' Choice in the First Looks roundup of personal information managers ("Keeping Your Info Together," January 20, 1998). This latest version of Day-Timer Organizer adds improved database access through Express utilities as well as full-featured editing capabilities.

Day-Timer has amassed a loyal following of users who have come to rely on every one of the program's productivity and organizational features. But for some users, this version was fraught with far too many problems. Their complaints ranged from not being able to print large address books or access help files to receiving mysterious error messages. In an effort to fix these problems, Day-Timer has posted an update to the program, which users can download

for free from the company's Web site (www.daytimer.com).

The update includes 80 fixes and enhancements. With the patch installed, users can now print address books with more than 170 entries and import information more smoothly from other organizers. It also improves the functionality of various Express functions, including having ExpressServices start up when Day-Timer 98 is activated. The update also eliminates the mysterious error messages that would appear while users were performing various tasks, including entering a long name when using the program's speed dial or trying to restore a database.

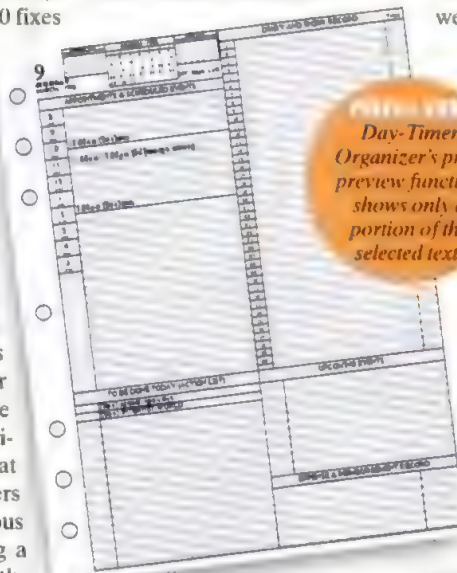
The Day-Timer update provides some enhancements to the program, including the abil-

ity to exit and close the ExpressServices through the File menu. And right mouse clicks will now include a "select all" option. The update has also cut down the steps needed to open older-version databases

that a second update will be available on its Web site by the time you read this. This patch will reinstate some features found in older versions of the program (the Save Settings option on the view menu, for example) that were left out of Organizer 98.

Also included in the newest patch are the tabs, which users had gotten used to in older versions of Organizer. When the program switched from plain text to a rich-text editor, the tab feature was traded in for the ability to use various fonts. Day-Timer has kept its new shortcut keystrokes, but it has also reinstated the older versions' familiar keys for deleting lines and words.

By adding too many new features (perhaps some of them not quite running perfectly), Day-Timer's loyal users had reservations about this newest version. But most people should be able to find the answers to many of their PIM's problems in these updates.



when activating Day-Timer Organizer 98 for the first time.

Although this new update has fixed many of the problems that concerned users, the vendor says

DIGITAL PRIORIS MX 6200

Digital Doesn't Deliver

By Leon Erlanger

In "Servers. Cheap.", a feature that appeared in *PC Magazine* on October 21, 1997, the Digital Prioris MX 6200 was a top performer, thanks to its 10,000-rpm Seagate Cheetah hard disk and caching RAID controller. Most of the other servers we reviewed came with hard disks that ran at 7,200 rpm. We gave the Prioris an Editors' Choice award based on its excellent performance; it also received a Best of 1997 award (*PC Magazine*, January 6, 1998) for the same reason. Unfortunately, se-

rious questions have arisen as to the actual availability of the Prioris configuration we tested.

Soon after the issue shipped to subscribers, we began to receive letters and e-mail messages from readers telling us that they were unable to obtain the Prioris MX 6200 configured with a 10,000-rpm Seagate Cheetah hard disk. When some readers called Digital sales, they were told that the Cheetah disk had not been qualified for use with the Prioris MX 6200.

Between mid-November and early January, we had several conversations and e-mail ex-

changes with representatives from Digital, who claimed that the system we had tested was in fact available on the market. In a recent letter, Digital claimed that the Prioris MX 6200 and the Seagate Cheetah drives had been qualified through extensive testing and had been available from Digital's channel partners several months prior to our review.

We also called Digital's sales line several times during that period, and each time we were given the same information: The Cheetah drive had not yet been qualified for the Prioris MX 6200 and would not be until the end of February 1998. Before then, such a configuration could theoretically be built and sold by a value-added re-

seller, but Digital would not support it. Digital had qualified several configurations with Seagate hard disks, but all of the approved drives ran at 7200 rpm. Our own contacts at Digital claim that this response from Digital Sales was due to the fact that Digital's storage division was not yet delivering the Cheetah.

Since *PC Magazine* cannot verify to its satisfaction that the Digital Prioris MX 6200 configuration tested in *PC Labs* is in fact widely available, we have decided to rescind both the Editors' Choice and the Best of 1997 awards for this product.

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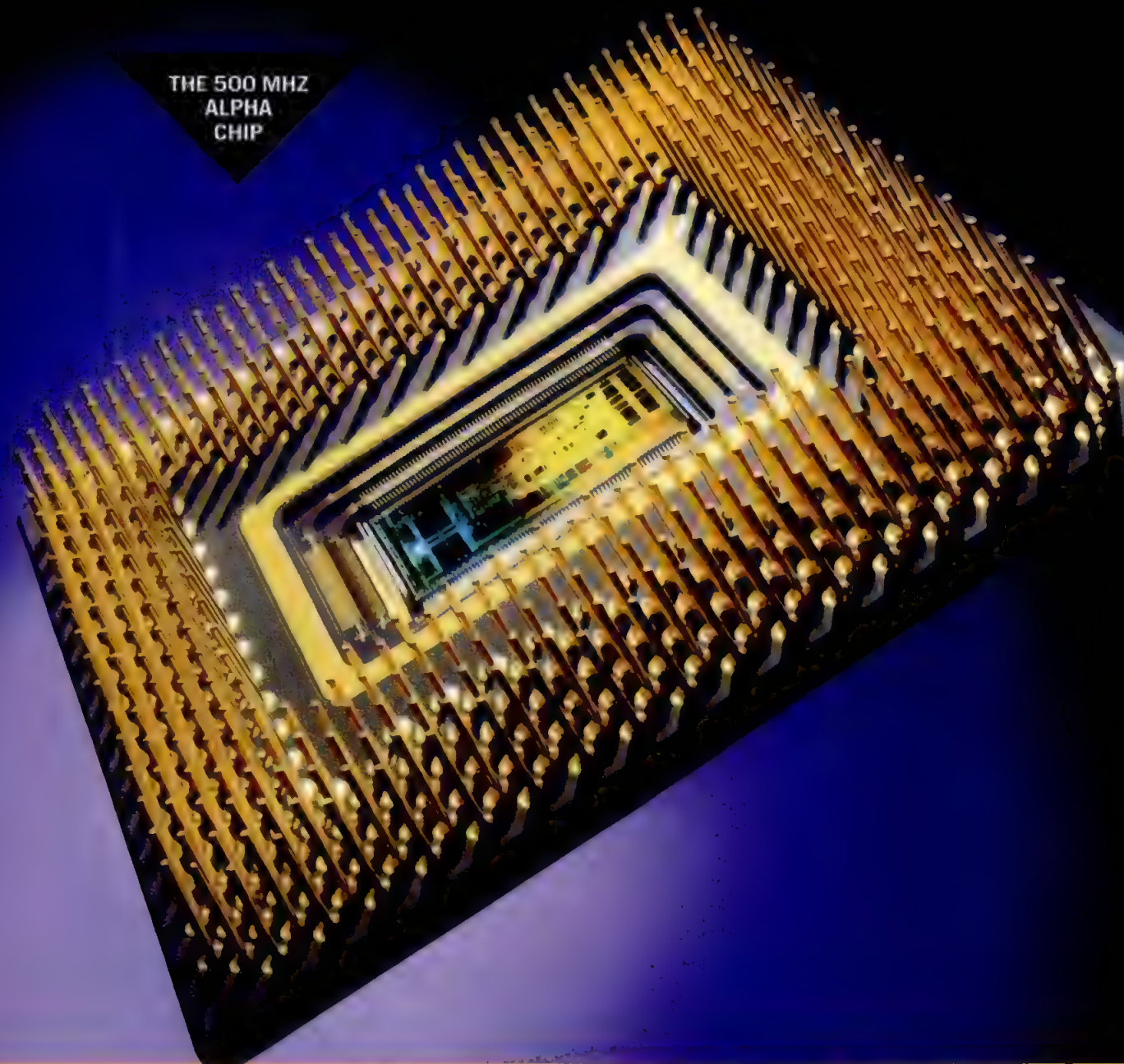
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Is Your Guitar Winking at Me?

I thought I'd seen it all. Convergence happens in every conceivable form, and in some that you can't conceive of. But the human mind is endlessly inventive, and some of its most creative thinking comes in conjunction with teaching devices. I spend a lot of time

looking at all the odd things that you can hook up to a PC, especially consumer products. The business market is saturated: The real future of personal computing belongs to innovations in traditional consumer areas. One of the latest innovations came across my desk in the form of Optek Music Systems' SmartLight guitar.

At first glance, it's a handsome Telecaster-style guitar: maple neck, rosewood fingerboard, ash body, with a pair of magnetic pickups. Then you begin to notice the small differences. The compensated bridge looks as if it came from an acoustic guitar. There's an extra pickup jack on the bottom edge of the guitar, and—hold on—there's a DIN connector there, too! When you see a DIN connector on a guitar, you naturally assume that the DIN is a MIDI output, there so that you can use the guitar to drive synthesizers and special effects. Surprise: On this guitar, the DIN is a MIDI *input*. The SmartLight itself is a MIDI output device, but it doesn't make a sound.

When you look closer at the fingerboard, you see that just behind each fret are six translucent areas, each holding a small light-emitting diode. When the SmartLight receives a properly encoded MIDI track, the fingerboard lights up in the places where you're supposed to put your fingers. Instead of looking at a book, a screen, or an instructor's guitar, you look at your own fingerboard.

The SmartLight is part of a hardware/software system geared to teaching guitar at any level, from beginner to advanced. At the most basic levels of learning guitar, you need to learn simple chords, scales, and melody lines. As you advance, you learn movable scales, barred chords, hammers, pulls, slurs, and bends. You pick up speed as you go and build technique.

The SmartLight comes with demo versions of Guitar Magic Lite and Master Tracks Pro. The first program is an instructional program; the second is a sequencer, notation, and MIDI music-editing program. Guitar Magic Lite is a tiny version of Guitar Magic, a thorough guitar course complete with two CD-ROMs' worth of instruction and video. Guitar Magic Lite offers only scales and chords,

with no videos, drills, or anything else to get a beginner going. Even the chord library is incomplete.

The Lite version is too lite, in my book. The School, Jam Session, and Licks sections of Guitar Magic are where you'd likely spend most of your time, and they're all absent from the Lite version. You have to spend an additional \$79 to get the full version. That's not a lot of money, since the software is equivalent to many months' worth of lessons, but the SmartLight is almost pointless as a learning tool without it.

Still, I found the full-neck scales useful, since this is an area where I've always been deficient. I've always had trouble translating a scale diagram on a page to the appropriate fingering, but having the proper frets lit up made it a no-brainer. After some practice, I could turn the lights off and repeat the scales from memory. Seeing the patterns and the finger placement right under my fingers was helpful.

The SmartLight system includes the SmartPort, a box that connects your computer, a power supply, two guitar ports, and a foot pedal that acts as a single-step control for Guitar Magic. The second guitar port makes the system useful for instructors and students working together. Optek has specific materials and hardware for guitar instruction, including a group-oriented port box. The company also sells albums of SmartLight-ready tracks from famous artists such as Eric Clapton, B.B. King, Steve Miller, Sting, and Travis Tritt. Each album contains easy chord tracks and a more difficult track that closely matches the lead guitar work on the original songs, so you can strum along or take on the big riffs.

The SmartLight has a thin, wide neck, a nice compromise between providing speed and fingering ease. A solid, midrange instrument better than the average beginner guitar, it looks great and sounds good. That acoustic-style bridge has a piezo pickup, which you use instead of the magnetic pickups when the lights are on: The magnetic pickups are too sensitive to the interference caused by all the electronics. You may still be able to pick up a '97 model from www.optekmusic.com for as little as \$399. **PC**



GUITAR LESSONS
I looked closer at the SmartLight and saw six LEDs behind each fret. Then the fun began.

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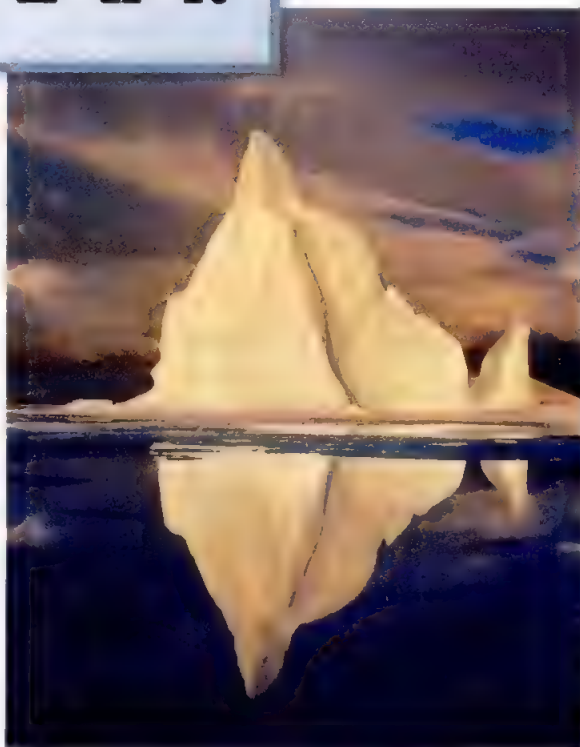
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Destroying Spam for Good

I'm for freedom of speech and freedom of the press and all sorts of rights. Heck, I went to Berkeley! But this spam situation is completely out of control and invites legislation. This has to be avoided, since legislation will trickle over to real free-speech issues,

which is usually disastrous. But regulation, not legislation, is possible. My argument for regulation is that spam mailing is not e-mail but broadcasting, and it can be regulated as such.

Spam, for the three of you who don't have e-mail, is the code word for unsolicited, untargeted mass e-mail mailings. It's a popular form of junk advertising, since you can get a message out to millions of people for very little cost. The theory is that it costs the same to send e-mail to 4 million people as to send regular mail to 300 potential customers. So send out the 4 million e-mails and see if you can turn 300 into 301.

At this point, I essentially have had to close my AOL mailbox because 90 percent of the mail is spam. Filtering helps, but it's not the complete answer. With most mail readers, you can filter a number of variables. Unfortunately, until people choose universal methodologies for e-mail addressing and distribution, many of these techniques will wipe out important mail, too. For example, I throw out all mail from *juno.com*. There is only one guy I know who uses *juno.com* as a real e-mail provider, and he can call me on the phone. When the spammers moan about how AOL is trying to ruin them by keeping out millions of messages, consider the effects of recipient boycotts. As far as I can tell, the folks at *juno.com* encourage junk e-mail. And because so many junk e-mailers use *juno.com*, nobody who uses it legitimately will ever get a message through to me. Sorry. AOL could be next.

Beside simply trashing mail from an offending site, you have to look at various tricks. Many subject lines can be filtered. I trash anything with XXX in the subject line. Unfortunately, there have been too many spammers who try to trick you by putting "Hi!" or "Where have you been?" in the subject line. Luckily, in many of these cases, you discover that the mail isn't being sent to you directly but to a mailing list: Your name doesn't appear at all in the "To:" header. But this is difficult to filter, because legitimate newsletters are distributed in the same manner.

With mail programs such as Eudora, you can specifically block all mailing-list mail but put an exception flag up when

you want specific newsletters. The problem is getting the first newsletter into the box so you can see how to handle it. If you're blocking all mailing-list mail, you have to turn off the block to get the first newsletter into the box. In my case, I could easily have a hundred messages (although the *juno.com* block minimizes this); then I have to go through the spam one message at a time before I find the newsletter. This sucks. Newsletter publishers should have specific filter requirements at the bottom of their newsletters (or as an addendum) to make sure the newsletters get to a recipient who is blocking all mailing-list mail.

Once your spam is under control, you'll still see some of it slip through and into the mailbox. But at this point it becomes manageable and something of a game. You look at the spam and figure out how it got through and what you can do to prevent that from happening again. You'll slowly improve your filtering techniques and get a better grip on Boolean logic.

What annoys me most are the unsolicited sex-site spams that go to my 12-year-old son. He complains about their clogging up his box, but why should he be getting this crap in the first place? Most spam I see is for porn Web pages. This has to stop, because children with e-mail are being inundated by this garbage. I have no problem with AOL or any mail service filtering these solicitations.

Hence the argument I would use is that this isn't mail, it's broadcasting. A wacky form of broadcasting, but broadcasting nonetheless. It's totally indiscriminate. This simple concept is the key to stopping it. Historically, broadcasting has been regulated. The counterargument from the spammers would be that their mailings are more like cable than NBC. I'll buy that argument if we accept the fact that cable operators can and do control content. Thus, AOL can ban spam the same way that a cable company can refuse to pump porn into Biloxi.

The way I see it, these spammers have been irresponsible and most inconsiderate. People do not like spam or spammers. Legitimate marketers will find the Internet ruined by these folk. High time it stopped.



SPAM

My argument is that spam is not e-mail but broadcasting, and it can be regulated as such.

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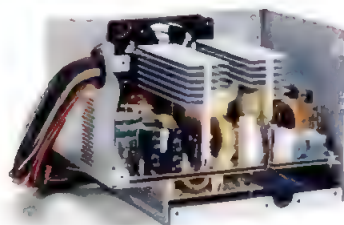
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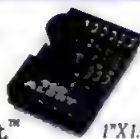
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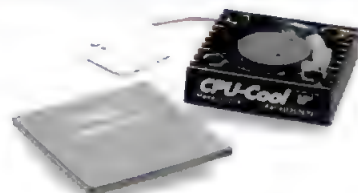
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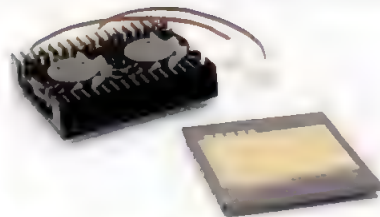
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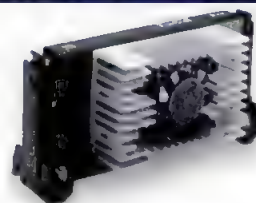
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Inside Track

Look for things to **heat up** in the removable disk drive market as a new start-up, Castlewood Systems (Pleasanton, CA; www.castlewoodsystems.com), enters the fray. Its promises may be hard to fulfill, but they could potentially **decimate the market**. Castlewood's first product is the **ORB removable-cartridge** hard disk drive. Using MR technology, the company will get **2.16GB** on a single platter. The clincher is that this drive is expected to sell for \$199, and the **blank 2.16GB cartridges will cost only \$29.95 each**. This goes right after the \$599 Syquest 4.7GB drive, whose cartridges may sell for about \$200 when it first ships.

Castlewood Systems was founded by Syed H. Iftikar, a founder of Syquest who was pushed aside in favor of a team that could take on marketing-driven Iomega. As far as I'm concerned, with the super little SyJet 1.5GB removable hard disk, Syquest is now leading the pack in removable disks. The negative litany about Iftikar is that he promises more than he can deliver at any point in time, although he always manages to deliver someday. The positive litany is that he's a genius in this arena and has some of the best engineers from Syquest working with him. This means we'll see an ORB drive and the \$15-per-gigabyte high-speed storage price point. But when? Iftikar told me, moreover, that he can get the drive's price **down to \$99** faster than anyone wants to believe. If that is true, this drive could essentially **wipe out** Iomega, if not Syquest, unless lots of prices are changed. **A Zip drive for \$25, perhaps?**

The potential fly in the ointment for Iftikar is his corporate structure. He intends to make Castlewood Systems a **virtual corporation**, with no manufacturing capability. The company has partnered with various head and drive makers and component builders in such a way that overhead is minimal. Though this idea always looks good on paper, it's fraught with danger, because you lose control of too many aspects of the business. Partnerships like this are **always flaky**.

Another company to keep an eye on is Pixera Corp. (Los Gatos, CA; www.pixera.com), headed by the famed Yuji Ide, arguably the inventor of HDTV and even digital imaging. He left Japan to become an American entrepreneur and currently produces a line of **megapixel**, full-motion, digital-tethered video cameras for medical and industrial use. Pixera now has a line of expensive personal cameras, and **the quality is phenomenal**. But the kicker is a soon-to-be-announced **thumbnail-size camera** with a lens no bigger than an asterisk that produces an astonishing image by any standard. Ide expects to **blow open the market** with this \$50 gem. This is the kind of

*Using MR technology,
Castlewood Systems will
get 2.16GB on a single
platter. The clincher
with this drive is that
it's expected to sell
for \$199, and the blank
2.1GB cartridges will
cost only \$29.95.*

camera that we'll be using for personal surveillance. **Little Brother really is watching.** You can have half a dozen such cams strung up all over the place unseen. Welcome to the 21st century—I see you!

The Digital Photography Realm Takes a Weird Twist Dept.: Seemingly out of the blue, a new format has emerged, led by a consortium of Japanese camera makers. The group calls itself the **Camera Image File Format Forum**, and the format (called CIFF) is a superset of JPEG. It competes directly with something called EXIF, which has been adopted by Fuji and Kodak to manage images within the digital camera. Oh and yes, there is an operating-system aspect to this, too (camera operating system—

COS). The most noteworthy COS is being developed by FlashPoint Technology out of San Jose. This company—and various digital camera competitors, especially Kodak—wants to create a **seamless environment** for digital photography, which means a world without various formats and necessary conversions and incompatibilities. The hope is that you'll be able to walk up to a kiosk with your digital images and somehow make prints right there. You're also supposed to be able to take the memory card, half-filled with pictures, and stick it into a different camera from a different vendor and just keep shooting pictures. Currently, each camera has a proprietary format on its memory card, if not other incompatibilities. This is bound to shake out as more people get into digital photography.

Old Wine in New Bottles Dept.: I've been following the odd technology from Texas Instruments called **digital micromirrors**, which was finally dubbed the DMD chip—meaning **digital micromirror device**. This small chip, which has 40,000 miniature mirrors, is used to produce a projected color image that will eventually compete with and perhaps **wipe out** polysilicon LCD projectors, which keep getting better and better. TI has never been able to get good yields on the DMD chip, so the chip has developed a bad rep—a “They can't make 'em!” kind of thing. I laughed when I saw the company's solution: **Change the moniker**. So now the DMD chips are referred to as MEMS—**micro-electromechanical systems**. Sheesh, the name stinks. Meanwhile, a new variation has appeared from a company called S-Vision in Santa Clara, California. The technology is reflective, as is the MEMS technology. It uses something called liquid crystal on silicon (LCOS) and has the same potential as MEMS to be a world beater, if S-Vision can actually make such a chip. But since I've heard **so many promises** over the years about DMD—er, I mean MEMS—I'm skeptical. Another technology to watch—if nothing more. **PC**

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My Secret Weapons for Web Surfing

With Netscape's stumbles, Internet Explorer 4.0's great features, and Microsoft's marketing clout, the battle's all but over in Web browsers, right? And as for connecting to the Web, 56K modems are the last step—at least, until ADSL or cable modems are available

in your neck of the woods, right? Not so.

I want to tell you about two interesting but virtually unknown Web products that can increase your productivity and maybe even your fun while on the Web. And I bet you never heard of either.

The first is one of my favorite browsers. Lynx, the old character-only browser? NSCA Mosaic? Nope, none of the above. It's Opera, just released in Version 3.0. Never heard of it? I'm not surprised. It comes from Jon Stephenson von Tetzchner and Geir Ivarsøy's Opera Software, in Oslo, Norway, and has no commercial distribution. But you can easily download it from www.operasoftware.com. And it's not one of those hours-long 10MB downloads, either: The compressed executable is just 1.2MB—small enough that you can actually save it to a floppy disk and (legally) pass it around among your friends in that form.

Why, in the age of IE 4.0 and Navigator 4.0—two blockbuster, feature-rich megabrowsers—would anyone bother with a tiny, unknown Web browser from a couple of equally unknown guys in Scandinavia? Precisely because it doesn't have all those features. Which means, in a word, *speed*.

For any given Web site and any given ISP connection to the Web, Opera is about *twice* as fast as the Microsoft and Netscape behemoths. Note that this increase in speed doesn't come at the price of forsaking graphics, giving up a well-designed interface, losing access to favorites lists, or anything else essential to enjoying the Web. Except Java support, which Opera will not include until Version 4.0, due later this year. (Hmmm: Those who think Java applets are the biggest curse of the Web already have a reason to change to Opera.)

Opera includes a good newsreader plus full FTP, Gopher, SSL, and WAIS support. There's a primitive send-only mail feature; stick with Eudora Lite or Pro for your e-mail needs. A wonderful scaling control at the bottom right-hand corner of the display lets you adjust the display size without fiddling with font sizes (at the cost of some

pixelation, of course). Opera will even convert your IE Favorites list, though not Navigator Bookmarks.

If you want concrete evidence of the price that today's "feature bloat" has extracted in terms of software performance, look no further than the IE/Navigator versus Opera comparison.

Do I think you should change to Opera from whatever you're using today? Not necessarily. But I do think you should add it to your toolkit of Web browsers. Many of us today keep the current versions of both IE and Navigator on our machines. That doesn't cost anything other than the hard disk space devoted to each. Just add Opera as your third available browser and use it—as I do—when raw speed is most important. For me, that's probably half the time I spend on the Web.

As shareware, Opera is free to download and use for 30 days; registration is \$35. There's a 50 percent education discount for qualifying faculty and students. I could take another 2,000 words to tell you everything I like about Opera—its style, performance, and interface. Or you could download it and give it a try in less time than you would need to read those words. Trust me: It's worth the download.

My second secret Web weapon is just as obscure, and even weirder-sounding than converting to a Norwegian shareware Web browser.

Ramp Networks' Web Ramp M3t appeared about six months ago. I was among its early testers—in part because

I was so skeptical it would work. I've waited this long to recommend it, because it's taken me that long to overcome my skepticism. Well, it's real and it works. The M3t may or may not be for you, but if you need it, it's a great answer to a frustrating problem.

The M3t attaches to your PC via an Ethernet card, lets you connect up to three modems (each linking to a separate ISP account via a separate phone line), and then bonds those three connections into one. The result: a much faster Web connection.

In theory, you can attach three 56K modems and wind up with an almost-150-Mbps connection. It doesn't quite work



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JIM SEYMOUR

that way, and not only because 56K modems never deliver their claimed speeds. But the M3t *can* give you about twice whatever speed you're using for dial-up over modem lines now, which may or may not be a good deal—depending on your telco's alternatives.

I found the most bang for the buck in the M3t that came with two modems, giving me about 75 percent more performance than a single modem/ISP connection. A third modem, ISP connection, and phone line added only another 25 to 30 percent or so in speed—not worth the additional expense, at least for me.

Note that the cost of the M3t's speed gains is not trivial. In addition to the M3t (\$550 street), you must buy two or three external modems, buy and install one or two more phone lines if you haven't any free lines available, and sign up for one or two additional ISP accounts beyond your present connection.

Whether that's a good deal for you depends on your other connection options. How much do you really care about Web connection speed? Can you get a good 56-Kbps connection in your area, from an ISP with intelligent, robust support for 56K? Can you get a 128-Kbps, bonded ISDN connection cheaply? Are cable modems or ADSL telco links available locally? If the answer to any of those questions is yes, then the M3t probably isn't the route for you.

One hidden advantage of the M3t is that it's also a nice four-port Ethernet hub. If you need a couple of Ethernet ports—for a second or third PC, or printer sharing, for example—the economics may tilt in favor of the M3t anyway. Connected PCs share that fast Web connection. If you don't need the Ethernet hub and only plan on bonding two modems, you can opt for WebRamp PC (\$49; download from www.rampnet.com), a software-only solution using the same technology as the M3t.

Another possibility: new modems with the internal capability of bonding two (but not three) separate ISP connections, which will appear this year. Watch 3Com/U.S. Robotics and Best Data for announcements.

There is a feeling of jury-rigging things when setting up an M3t, but despite my initial skepticism, it's easy enough and really does work. For many of us, there are cheaper paths to faster Web connections, but if you're in a suburban or rural area and can't get ADSL, cable, or ISDN service anytime soon, this is an intriguing and effective way to double your Web connection speed. **PC**

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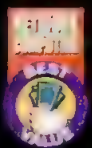


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The Wired Home

The interconnected house is just around the corner. Within the next year, we're going to reach the Holy Grail of home and small-office networking—networks with no new wires. The best way to network a house is the same as the best way to network an office.

Run hundreds and probably thousands of feet of wiring. But even in a new house with the walls still bare and open, you could be looking at \$2,000 plus for the cables and labor. In existing construction, you could hit \$5,000 without breaking a sweat.

Most normal people want something simpler and cheaper. There are three ways you can do that. First, there's pure wireless. Wireless infrared (IR) doesn't work, because it doesn't go through walls. Wireless radio frequency (RF) works, but it isn't cheap or particularly fast, and it might not even reach end to end in a large house. RF, however, does hold promise for the future.

Second, you could use phone lines for networking. Remember that networking wire is nothing more than high-grade phone wire. I don't see any breakthroughs here in the short term, either, because most phone wiring (a) is of mediocre quality for sending data quickly or reliably and (b) meanders through the house when you really want home runs back to a central point. Stay tuned, though, because this isn't outside the realm of technical possibility.

The third—and currently the most practical—possibility is carrier current, meaning the AC lines in your house. Right now, a couple of smaller firms such as Intelogis of American Fork, Utah (www.intelogis.com), are developing products that work at somewhere from 100 to 500 Kbps—roughly the speed of a floppy disk transfer. You plug a transceiver module with a printer pass-through into your parallel port, and the other end into a 120-volt wall outlet. (This is definitely one kind of product where you want to look for the UL sticker.) Based on Intelogis's pricing models for its Passport and on what PC vendors are hinting at for unannounced products, the cost will be about \$100 per PC. You don't need a hub as you do for traditional, wired Ethernet networks, but you're limited to about half a dozen devices on your mini-LAN, a limitation that's not an issue for most homes.

If you live in a house where the kids have their own computer but no longer want it in the same room as the

parents' computer—if they're playing noisy games, maybe you don't want it there, either—AC-line networking will be a real benefit. Even working from another room, they'll still have access to the same printer. As with traditional peer-to-peer LANs, you can access any available resources on other computers.

If you have X-10 light controllers in your house, though, this setup will wreak havoc with them. Also, the data travels outside your house as far as the power company's nearest transformer, so unless you want your neighbors tuning in, make sure everything is password-protected.

Though most vendors target AC-line networking at home and family settings, there's no reason it couldn't be the LAN of choice for, say, a temporary workgroup. How well this solution is received in business settings depends on how fast the data moves. Intelogis's 350 Kbps sounds at the lower end of what I'd call acceptable. The 1 or 2 Mbps that Intelogis says it has running in the lab sounds workable, and a full 10 Mbps sounds like "Where do I sign the check?"

Meanwhile, in January IBM announced Home Director Pro, a structured wiring and services program targeting new homes and bare-walls remodels. This is similar to what's being done now by IES, Lucent, USTec, and other vendors: snaking two RG-6 coaxial wires to every room in the house for video distribution and two Category 5 wires for phone and networking—all

routed back to a central point and connected to PCs, lights, the furnace, and the alarm system. My guess is that IBM wants to sell you a \$500 PC along with this to act as a dedicated whole-house controller. And once it has a handle on the wiring inside your house, there's no reason why you couldn't also hire IBM to monitor and diagnose the health of your PC from afar, provide off-site backups, or even monitor your burglar and fire alarms.

It's an open question whether IBM has done a good job of selling home PCs. But I believe Big Blue's technology for the home remains the most visionary and thoughtful. There may be life yet in IBM. **PC**



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- Iomega Zip 100MB IDE Internal Drive w/One Cartridge
- Subwoofer Sound System w/Amplified Stereo Speakers
- MS IntelliMouse
- Microsoft Natural Keyboard Elite
- MS Windows 95
- Microsoft Office 97 Small Business Edition

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the 1998

UTILITY guide

For our annual roundup of desktop utilities, we tested 225 products to find the best tools to help you get the most out of your PC. By John Morris

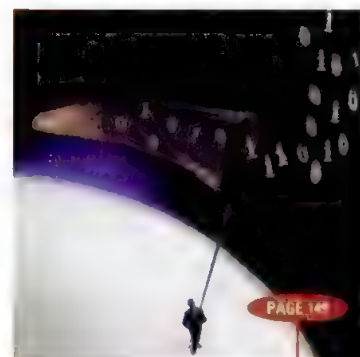
When you consider all the exciting advances in personal computing over the past few years, you might reasonably expect that the demand for utilities would diminish. But that's not the case. True, our operating systems now include tools for solving problems and tweaking performance.



PAGE 125

Solve PC Problems

Murphy's Law could have been coined to describe PCs. If it can go wrong, chances are it will. Fortunately, there are tools to help you cope. These troubleshooting utilities address a whole gamut of problems.



PAGE 108

Back Up Your Work

Don't get caught flying without a parachute. Backup utilities make it so easy to protect against catastrophic data loss or hard disk failure that there's no excuse for losing work or time. The newest backup utilities support a range of devices and include full disaster recovery.

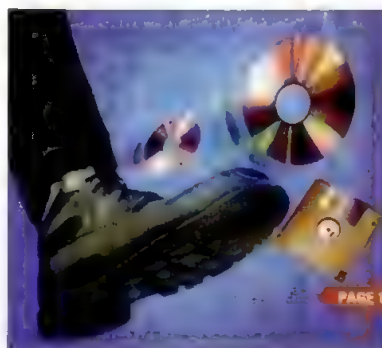
ILLUSTRATIONS BY WILLIAM DUKE



PAGE 109

Protect Your Files

In the Internet age, antivirus programs have become mission-critical tools for all users. We tested 11 antivirus programs for Windows 95 and found that most are quite adept at catching viruses in the wild. Perhaps the best news is that they're also becoming easier to use.



PAGE 130

Clean Up Your Hard Disk

Windows leaves a lot in its wake. Even if you use its built-in Add/Remove Programs applet, you're not getting rid of everything. To give your PC a thorough spring cleaning, you should invest in an uninstaller.



PAGE 157

View Files Faster

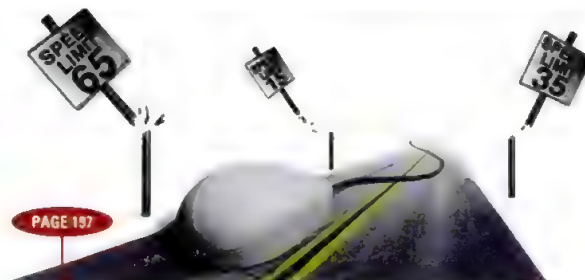
You could get by without a file viewer, but you may find it a valuable tool. File viewers let you view or print a file without launching the application that created it. You don't even need to have the application installed. From Ami Pro to ZIP, with a file viewer you're all set.



PAGE 163

Take Care of Other Tasks

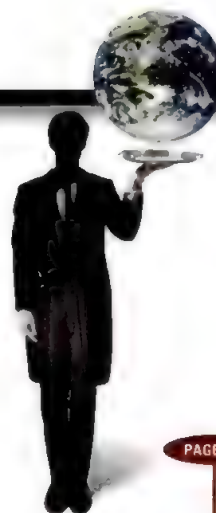
No matter what your needs, chances are good for finding a utility out there to help. We cover a range of useful tools. Topics include file compression, hard disk tools, data encryption and surveillance software, and multiboot utilities.



PAGE 197

Speed Up Browsing

Browser accelerators promise a cure for the World Wide Wait. Essentially, they "browse ahead"—downloading the pages linked to the one you're viewing so they're on hand when you click on them. Our tests show they can improve performance, but don't expect miracles.



PAGE 213

Complete Your Net Tool Box

We round out our coverage of Internet utilities with a section on miscellaneous tools including FTP utilities, e-mail notifiers, and browser utilities (collaboration tools, push, off-line browsing, news readers, and bookmark managers).



PAGE 177

Defend Against Invaders

A new addition to our annual utility block-buster, desktop security suites protect against a new type of threat: downloads. These products alert you whenever you attempt to download files that could destroy data or cause other problems, and most offer antivirus protection as well.



PAGE 203

Find Information Faster

The Web is no place to go without a good guide. Popular search engines and indexes such as Yahoo! and Excite can point you in the right direction, but finding just the right information is still a challenge. But with these tools, you'll never wander the Web in vain.



PAGE 221

Do Tasks in Other OSs

It's largely a Windows 95 world, but not everyone has made the switch. Still others are planning to move to Windows NT. In this final section, we survey the many tools available for those using IBM OS/2 Warp, Microsoft Windows NT and Windows 3x, and MS-DOS.



PAGE 185

Monitor a Child's Access

The U.S. government can't restrict access to sites on the Internet, but parents can by using parental filtering tools. In addition to blocking access to objectionable sites, filtering tools can prevent children from submitting information in chat rooms or on the Web.



PAGE 207

Send Quick Messages

Instant messaging can be fun, but don't mistake these clients for toys. The latest can send URLs and files and host group chats. And new security features make them suitable for business communications. When e-mail is too slow, this is a great tool for individuals or workgroups.

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The headaches of adding hardware have receded thanks to advances such as plug-and-play. And smarter applications include their own uninstall options and even update themselves over the Internet. But despite all this progress, PC computing is still far from being a utopia for users. As this year's blockbuster Utility Guide demonstrates, the PC utilities market is alive and thriving.

The 225 utilities we review here address perhaps the widest range of computing chores we've ever assembled in this annual feature. In the following pages, you'll find products to protect your system, keep it running in top form, minimize the risk of emergencies, and work more efficiently. All of the usual suspects are here, and not surprisingly, again this year, the significant growth areas were in the Internet arena.

With so many options, you may find the problem is not in finding all the tools for the tasks at hand but in choosing the ones that you really need. This year, we've made it easier for you. Our "Essential Toolkit" sidebar highlights the five tools that we think most users should keep on their systems—antivirus, uninstaller, troubleshooter, file compression, and personal backup. This is a good head start, but no two users have identical needs or work quite the same way, so you'll want to take the full tour of our pages, making stops along the way. Here are some guideposts.

FROM ANTIVIRUS TO ZIP

Whether you use your PC at work or at home, an antivirus program should be at the top of your utilities shopping list. The main job of an antivirus program is to scan for viruses and to repair, quarantine, or delete infected files.

Not all PC problems come from outside sources. In fact, the majority of system snafus are seen to be of our own creation. Troubleshooting utilities address this kind of problem, which includes software troubleshooting, hardware diagnostics and reporting, and system tune-up.

Don't wonder whether you really need an uninstall program: You probably do. The fact is that applications leave a lot

behind. Uninstallers take snapshots of your system so they can remove applications safely—and more thoroughly than the Windows option. New features let you clear out cache files, ActiveX controls, cookies, and plug-ins that accumulate as you browse the Web. No utility can completely eliminate potential hazards. If and

when true disaster strikes, a personal backup program can help ensure that you'll soon be up and running again. One notable new feature, available in about half the products we tested, is a Windows 95 disaster recovery scheme that lets you rebuild your registry if it should become corrupted.

Not all utilities are designed to address or avert problems. Some of the most useful tools perform specific tasks that simply make computing more productive. File viewers, for example, let you glimpse files without launching (or even installing) the

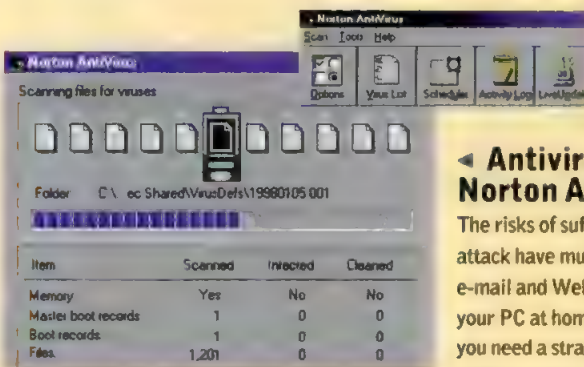
If you love utilities, head for our Web site to check out **INTERACTIVE SUMMARIES** of features, download demos, and join in **DISCUSSIONS**. We'll also have animated **WALK-THROUGHS** of the best products.

www.pcmag.com/utilityguide98/

The Essential TOOLKIT



Of the many types of utilities covered here, these five are must-have tools.



Antivirus: Norton AntiVirus 4.0

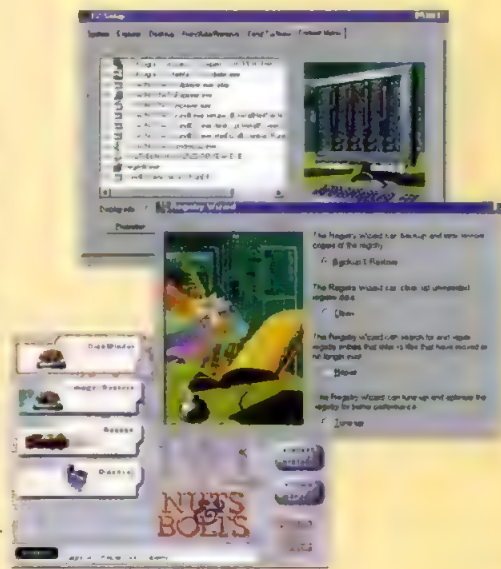
The risks of suffering a computer virus attack have multiplied with the increase in e-mail and Web usage. Whether you use your PC at home or in a corporate setting, you need a strategy for fending off viruses.

This year's recommendation, Norton Anti-

Virus 4.0 (NAV), from Symantec Corp., is hardly the most innovative product, but it is both effective and easy to use. NAV's detection engine performed well on our tests, and it offers a comprehensive set of scanning options and a year of free virus definition file updates.

Troubleshooting: Nuts & Bolts

No PC is an island. We are constantly adding or removing applications, downloading files, and installing new hardware. In the process, there's plenty of opportunity for things to go awry. No one troubleshooting utility can take care of all the problems that can come your way, but Network Associates' Nuts & Bolts comes closest. A comprehensive utility, Nuts & Bolts includes troubleshooting, tune-up, and hardware diagnostics and reporting tools. Other extras include a module for customizing Windows, a file shredder, encryption, and file compression.



applications in which they were created. We also look at a bunch of other utilities for file compression, data encryption, multibooting, and dealing with hard disks, monitors, printers, and sound systems.

The Web creates new opportunities for computer users, but it also poses new dangers. Web security suites, a new category covered in this roundup for the first time, alert you when servers attempt to download components such as ActiveX controls, Java applets, or cookies that could damage your system. Parental filtering utilities

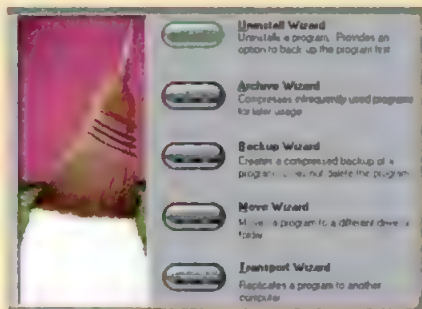
address a different kind of Internet threat. These packages prevent children from accessing Web sites that contain objectionable content and monitor Internet usage.

Other Internet tools we review here include utilities that boost Web downloads, tools that enhance Web searches, and programs that send quick messages over the Internet. In the final Internet-related section, we gather together tools such as FTP utilities and e-mail notifiers. Our sidebar "Eaten by the Browser" surveys several categories in which third-party packages

have been partly co-opted by tools in Internet Explorer and Netscape Communicator.

Finally, we tip our hats to PC users not running Windows 95 with a section on utilities for IBM OS/2, Microsoft Windows NT, and MS-DOS, as well as Windows 3.x.

In a telling sign of just how healthy the utilities market continues to be, no single vendor this year earned an Editors' Choice in more than one category. That bodes well for users, because it means the choices for keeping a PC in top shape will continue to be numerous.

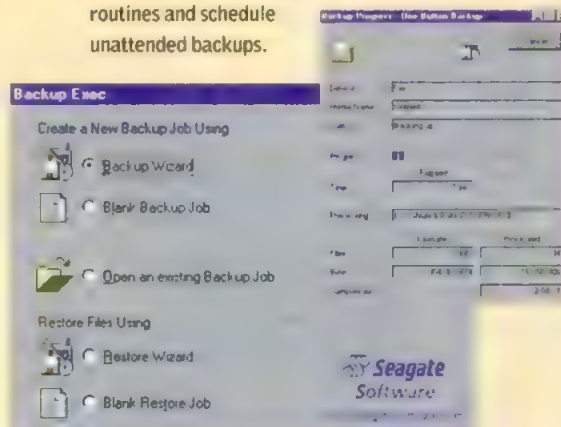


▲ Uninstaller: CleanSweep Deluxe

Microsoft Windows is the pack rat of the PC world. Even with today's smarter applications, removing programs safely and thoroughly is an arduous task, which is why an uninstaller remains an essential tool. The clear choice in this category is Quarterdeck's CleanSweep Deluxe. CleanSweep is easy to use and delivers the best performance. A SafetySweep feature prevents you from deleting critical system files. And the InternetSweep can rid your system of the many files that accumulate as you browse the Web, including cache files, ActiveX controls, plug-ins, and cookies.

▼ Personal Backup: Seagate Backup Exec

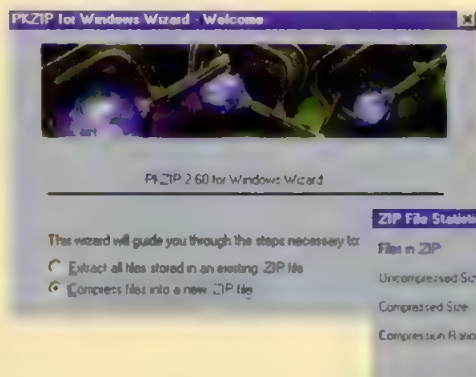
All the utilities in the world won't save you from catastrophic data loss or hard disk failure unless you back up your data. Fortunately, there are many products out there that can make this chore relatively painless. The best one currently available is Seagate Backup Exec. This utility supports virtually every backup device, including tape drives, removable drives, floppy disks, and network drives. Backup Exec offers full disaster recovery and you can create an unlimited number of backup routines and schedule unattended backups.



◀ File Compression: PKZip 2.60 for Windows

Whether you send a large quantity of e-mail attachments or download files from the Internet, you need

a file compression or ZIP utility. We recommend the product that created the category, PKWare's PKZip. Formerly a DOS utility, PKZip now offers all the usability enhancements that come with the Windows world and the most information on archives.



OTHER TOOLS WE RECOMMEND

Troubleshooting: First Aid 98 is the easiest way to diagnose and fix PC problems.

File viewer: Quick View Plus 4.5 lets you view, copy, and print some 200 file types.

Security suite: eSafe Protect provides desktop-, gateway-, and server-level protection from Internet vandals.

Parental filtering: Cyber Snoop 2.07b is the best solution for parents who want total control over their children's Internet usage.

Navigation and search: Alexa 1.2 and Copernic 1.1 are our top choices for finding what you want on the Web.

Instant messaging: ICQ can help you find out who's online and drop them a line without having to conduct a directory search.

E-mail: With the CheckMail 32 1.50 for POP3 accounts, you'll always know when "You have mail."

Browser plug-ins: To get the most out of the Web browsing experience, you'll want these essential plug-ins:

- Real Networks RealPlayer 5.0,
- Macromedia Shockwave/Flash players,
- Apple QuickTime, and
- Adobe Acrobat Reader.

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What's Already in WINDOWS



As this year's Utility Guide demonstrates, there's still plenty of opportunity for software developers to enhance Windows. Nevertheless, you may not be aware of all the tools already provided within your operating system. This table is based on the beta versions of

Windows 98 and Windows NT 5.0 Workstation, as well as information provided by Microsoft. In general, expect to see many of the tools slated for Windows 98 also make their way into Windows NT 5.0 Workstation, which is scheduled to ship later this year.

	Windows 95	Windows 98 (beta 3)	Windows NT 4.0 Workstation	Windows NT 5.0 Workstation (beta 1)
Antivirus utilities	None. But the OS blocks most direct disk access, alerts to changes in the master boot record, and warns of unknown device drivers.	See Windows 95.	None. But the OS blocks direct disk access.	See Windows NT 4.0 Workstation.
Troubleshooting utilities	ScanDisk scans your hard disk and eliminates lost clusters and cross-linked files. A DOS version runs automatically if your operating system shuts down improperly or in the event of hard disk error. Device Manager lets you diagnose problems with hardware and drivers. System Monitor provides 59 different monitors of the computer and network. Resource Meter monitors system resources used by programs. The OS also includes a basic Disk Defragmenter. The Add New Hardware applet in the Control Panel walks users through the process of installing and testing new hardware devices.	The enhanced Dr. Watson utility intercepts software faults and provides feedback. The System Configuration utility, a graphical replacement for Sysedit.exe, lets the user troubleshoot system problems and back up and restore critical files. Version Conflict Manager detects conflicts and installs the appropriate drivers to correct the problem. The Automatic Skip Driver Agent identifies hardware devices that fail to respond and lets you bypass them. The enhanced Disk Defragmenter places all of the files associated with applications in the same location to improve performance. Tune-Up Wizard schedules tune-up jobs to run automatically on a regular basis.	Windows NT Diagnostics monitors system resources, including hard disks, CPUs, adapters, and peripherals. The Devices applet in the Control Panel provides basic feedback on hardware devices.	A basic disk defragmenter. With Windows NT 5.0, Microsoft brings Plug and Play hardware support to its NOS, alleviating many hardware-related problems.
Uninstallers	The Add/Remove Programs applet in the Control Panel lets you install or uninstall most Windows programs. Unlike the third-party uninstallers reviewed in this story, Add/Remove Programs monitors installations and cannot completely remove all traces of applications.	In addition to the Add/Remove Programs applet, Windows 98 includes a Disk Cleanup module that automates the task of cleaning unwanted files off the hard disk to increase free disk space. This tool is especially useful for cleaning out Internet cache files.	The Add/Remove Programs applet in the Control Panel lets you install or uninstall most programs. Unlike the third-party uninstallers reviewed here, Add/Remove Programs monitors installations and cannot completely remove all traces of applications.	Same as Windows NT 4.0, plus an operating-system service that can install, uninstall, or repair any Windows NT 5.0 application.
Personal backup utilities	Backup lets you back up to floppy disks or tape drives.	A new version of Backup supports SCSI tape devices and makes backing up your data easier and faster. A lite version of Seagate Backup Exec, one of this year's Essential Tools.	Windows NT Backup lets you back up your local disks and network resources to floppy disks or to tape devices.	A new version of Windows NT Backup now lets users back up local or network drives to a variety of media including tape. Also includes a revamped interface and wizards for backup and restore operations. A lite version of Seagate Backup Exec, one of this year's Essential Tools.
File viewers	Quick View provides viewers for 30 popular applications. Developed by Inso Corp., Quick View is a limited version of the Quick View Plus viewer reviewed in this issue. Quick View Plus supports about 200 file formats.	See Windows 95.	See Windows 95.	See Windows 95.
Internet utilities	In addition to support for frames, plug-ins, Java scripts, and ActiveX controls, the bundled Internet Explorer 4.0 features enhanced Java performance and support for cascading stylesheets and Dynamic HTML. It includes the Outlook Express e-mail client and newsreader, as well as push, off-line browsing, and collaboration tools. Internet Connection Wizard makes it easier to set up Internet accounts with national ISPs.	See Windows 95.	In addition to Internet Explorer 4.0 (described on the left), Windows NT 4.0 Workstation includes Personal Web Server, as well as an FTP and Gopher/Internet/intranet server. (Personal Web Server is limited to ten concurrent connections.)	See Windows NT 4.0 Workstation.
Miscellaneous utilities	Other useful tools that come with Windows 95 include multimedia applets for playing and recording sound and video, DriveSpace hard disk compression, a Clipboard Viewer, and the image-editing program Paint.	A graphical FAT32 Conversion Utility lets users convert a hard disk from the original version of FAT to FAT32. Windows 98 also includes the display enhancements previously available only in the separate Microsoft Plus! Multiple-display support lets you use multiple monitors or graphics adapters on a single PC. A centralized system information utility, Microsoft System Information Utility 4.1, gathers configuration information for technical support. Also includes an extensible, HTML-based help system.	Windows NT 4.0 Workstation includes the display enhancements that Windows 95 users must purchase separately as part of Microsoft Plus! (full window drag, font smoothing, wallpaper stretching, large icons, and high-color icons).	Supports the FAT32 file system. A new version of NTFS (NT File System) supports disk quotas and file encryption. Administrators can control disk usage from Internet Explorer or the Microsoft Management Console Disk Management tool. The Encrypting File System (EFS) lets users encrypt files or folders from the right-click menu. Another new tool automatically converts Windows 95 systems to Windows NT 5.0 and updates settings.

THE COMPLETE 1998 UTILITY GUIDE

Red type indicates our recommendations.

Troubleshooting

CheckIt version 5 page 126
TouchStone Software Corp.
www.touchstonesoftware.com

Firm 3.0 page 126
CyberMedia Inc.
www.cybermedia.com

Norton CrashGuard Deluxe page 127
Symantec Corp.
www.symantec.com

Norton Utilities 3.0 for Windows 95 page 130
Symantec Corp.
www.symantec.com

Nuts & Bolts page 132
Network Associates Inc.
www.networkassociates.com

Oil Change page 135
CyberMedia Inc.
www.cybermedia.com

PC Care 97 page 136
American Megatrends Inc.
www.ami.com

RealHelp Extra Strength page 137
Quarterdeck Corp.
www.quarterdeck.com

TuneUp.com page 135
Quarterdeck Corp.
www.quarterdeck.com

Antivirus

Dr Solomon's Anti-Virus 7.79 page 110
Dr Solomon's Software Inc.
www.dr Solomon.com

Dr Solomon's Anti-Virus Toolkit for Windows 95 7.79 page 110
Dr Solomon's Software Inc.
www.dr Solomon.com

eSafe Protect 1.02 page 110
eSafe Technologies Inc.
www.esafe.com

F-Prot Professional 3.01 page 111
Command Software Systems Inc.
www.command.com

IBM AntiVirus 3.0.1 page 114
IBM Corp.
www.av.ibm.com

Inoculan AntiVirus 5.0 for Windows 95 page 118
Computer Associates International Inc.
www.cai.com/cheyenne

Integrity Master 3.21a page 114
Stiller Research
www.stiller.com

McAfee VirusScan 3.1.1 page 118
Network Associates Inc.
www.networkassociates.com

Norton AntiVirus 4.0 page 119
Symantec Corp.
www.symantec.com

PC-cillin 3.0 page 119
TouchStone Software Corp.
www.touchstonesoftware.com

ThunderByte Anti-Virus Utilities 8.03a page 120
Authentex Software Corp.
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Vet Premium Anti-Virus 9.6 page 120
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www.vet.com.au

VirusSweep 1.0 page 122
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Uninstallers

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Quarterdeck Corp.
www.quarterdeck.com

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www.symantec.com

PowerCleaner page 142
Alpha Software Corp.
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Remove-It page 142
Quarterdeck Corp.
www.quarterdeck.com

Uninstaller 4.5 page 142
CyberMedia Inc.
www.cybermedia.com

WinDaemon 97 page 146
IMSI Corp.
www.imsisoft.com

Personal Backup

Backup Exec for Windows 95, Direct Tape Access page 150
Seagate Software Inc.
www.seagatesoftware.com

DataSaver Personal Backup page 150
Software Architects Inc.
www.softarch.com

NovaBackup page 151
NovaStor Corp.
www.novastor.com

Tape-It page 152
PGSoft Inc.
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File Viewers

AutoVue Professional page 159
Cimmetry Systems Inc.
www.cimmetry.com

Drag And View page 159
Canyon Software
www.canyonsw.com

KeyView Pro 6.0 page 160
Verity Inc.
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Quick View Plus 4.5 page 161
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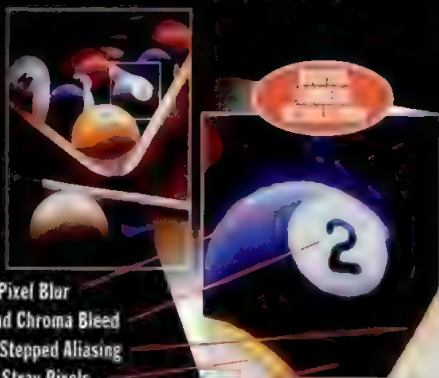
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- Fuzzy Logic Calculates Razor Sharp Edges
- Time Base Correction Enhances Dynamic Ranges
- Custom Chip Delivers 400% More Pixels
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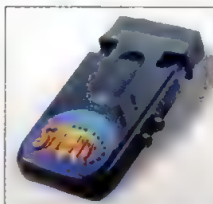
How Is This Possible?

It's a new scientific breakthrough called **8X Temporal Oversampling** and it makes the *impossible* — reality. Incredibly sharp, vibrant HDTV-quality digital pictures from any ordinary camcorder right into your PC. It's all made possible by a new custom chip called the HD-1500, invented by the mathematicians and researchers at Play Incorporated's advanced television labs, and you'll only find it in the amazing Snappy 3.0.



Fast, Easy And Simple To Use

Just plug Snappy into the parallel port of any PC (or laptop) and point your camcorder at a still scene. Then simply press the Snap button and Snappy's proprietary HD-1500 chip and AI-based DSP software algorithms will start 'chewing' on the picture. They'll automatically analyze every detail the camera is seeing (even parts of the signal you can't see) and actually *increase* the resolution of the images from your camcorder. Watching the razor-sharp, enhanced picture appear on your screen is almost magical. Snappy only exists today because of the millions of dollars spent developing the new patented technology behind **Trinity**™, Play's \$5,000 broadcast-quality video special effects system for the television networks. Now you can get the same breathtaking image quality in all your PC pictures. No matter what resolution you work in, from hi-res color printouts to fast-loading web images, you'll be astonished at the incredible difference in every picture.



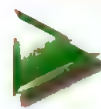
Winner of PC Magazine's "Best Peripheral of the Year"

Only Snappy can deliver stunning video stills with a true optical resolution of 1500 pixels (no bogus pixel stretching). In fact, Snappy holds the world's record for hi-res video capture because nothing else in the world (at any price) comes close to Snappy's unmatched resolution. That's why Snappy has won over 25 awards for technical innovation and engineering excellence from the world's top publications. **New Media Magazine** says "Snappy simply grabs the best video stills... it outperforms a digital camera." The experts at **Photographic Magazine** say "it offers the highest resolution, best quality video stills you can get." **Imaging Magazine** found that Snappy "beats a \$2,000 card" and **PC Magazine** raves "Nothing outperforms the Snappy ... the results are astonishing. Get one — you'll love it."

Snappy is already the best-selling, most award-winning way to bring video pictures into PCs on earth. Now you too can upgrade your existing camcorder to resolutions that visibly blow away those new \$2,000 digital cameras — all for only \$99. Snappy will even upgrade your VCR and TV to give you thousands of incredible PC pictures from any video tape or TV show.*

**The new Snappy 3.0 is available now
at computer stores everywhere.**

\$99



PLAY
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www.play.com

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Tiny lawyer words: Play's Snappy, the Snappy logo and Trinity are really cool and trademarks of Play Incorporated. All other trademarks acknowledged. Play is a trademark of Play Incorporated. ©1998, All Rights Reserved

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ANTIVIRUS UTILITIES

PROTECT your files

The Internet is a great place to catch a virus. Don't worry, though; these 11 antivirus utilities will protect your system. By Will Fastie

Once the sole purview of larger companies that needed to protect mission-critical data, antivirus (AV) protection should now be of interest to everyone whose PC is connected to the Internet. This year, more antivirus products are available than ever before to help protect users. The products are reasonably priced yet sacrifice nothing in terms of capability and power.

Because of the sheer number of products available, we limited our roundup to Microsoft Windows 95 products that are certified by the International Computer

Security Association (ISCA), which contributed to our Labs testing. Most vendors also offer support for multiple operating systems such as Windows 95 and Windows NT, as well as versions for DOS, OS/2, Windows 3.1, and Macintosh.

Antivirus software typically provides two types of protection: *on-demand*, in which the software examines files for viruses when prompted, and *real-time*, in which the software operates in the background and examines all activity for signs of viruses. Most products on the shelves today are ICSCA-certified, which means their on-demand scanners must detect 100 percent of viruses found "in the wild" and 90 percent of the remaining Zoo viruses, which are rarely found in the real world.

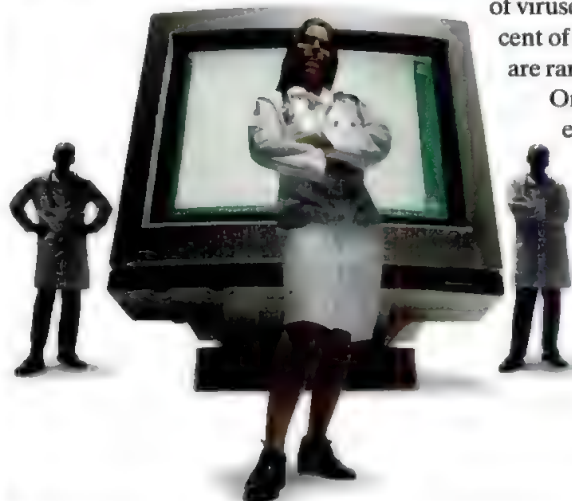
On supplemental tests, we evaluated each product's ability to detect macro viruses as files were opened. This proved to be quite a challenging task for many of the products. IBM AntiVirus, InocuLAN Anti-Virus for Windows 95, PC-cillin, and ThunderByte Anti-Virus Utilities each missed one virus, and eSafe Protect missed four.

The proliferation of Internet users has expanded the

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consumer segment of the market considerably, and AV vendors have responded by making products simpler to use. The user interface for these programs takes one of two approaches. Traditional, drive-oriented programs require you to configure the target media (file, folder, or drive) manually each time you scan. Five products employ this interface, including our Editors' Choice, Norton AntiVirus.

Alternatively, a more sophisticated, task-oriented method is showing promise. Such task-oriented programs let you define a number of virus-scanning tasks that you can save and subsequently reuse. Seven products here implement this method, while McAfee VirusScan employs two drive-oriented modules and one task-oriented one. Although the task-oriented approach lets you configure scans quickly and easily, many of the products that use it are less mature and lack the feature depth of the drive-oriented entries.

If you leave your computer on all the time, you'll appreciate the fact that most AV programs include a scheduling feature that lets you configure a scan to run while you're not using your PC. Otherwise, scanning speed may influence which AV product you choose, because a full scan typically slows down your system. All but three products here—Dr Solomon's Anti-Virus, Thunder-Byte Anti-Virus Utilities, and Vet Premium Anti-Virus—include schedulers.

We found that the real-time scanning capabilities of these products had only a minimal effect on system performance. Some products, however, make real-time scanning difficult to disable. For example, eSafe requires you to check the Autoexec.bat, Config.sys, and System.ini files, and the Windows 95 Registry to find all traces of the program.

Although all these products have some capability to detect unknown viruses, they depend on regular virus updates to ensure constant protection. With the exception of Dr Solomon's Software, all the vendors offer free virus updates from their Web sites. Quarterdeck, Symantec, and TouchStone take virus updating a step further by posting additional research information.

DR SOLOMON'S SOFTWARE INC.

Anti-Virus, Anti-Virus Toolkit For Windows 95

Early last year, Dr Solomon's Software introduced Dr Solomon's Anti-Virus (DSAV) (\$49.95 list), a consumer- and SOHO-oriented version of its corporate product, the task-oriented Dr Solomon's Anti-Virus Toolkit for Windows 95 (AVTK) (\$125 list). Because we've been impressed with the technical aspects of AVTK in the past, we were disappointed to find that DSAV's feature set is considerably weaker and lacks a scheduler, which AVTK has. And while AVTK fares a little better against the competition, its high price and limited capabilities make it less compelling than past versions.

DSAV's interface is easy to use, but its capabilities are extremely limited. You can only select one drive, folder, or file at a time. It's not possible to select combinations of files; scanning two files requires two operations.

In place of a scheduler, the company suggests users employ the Microsoft Windows 95 System Agent to schedule scans. This is a primitive replacement for even the most basic AV scheduler, however, and is only available with the Windows 95 Plus! package, which means some users won't have it on their systems.

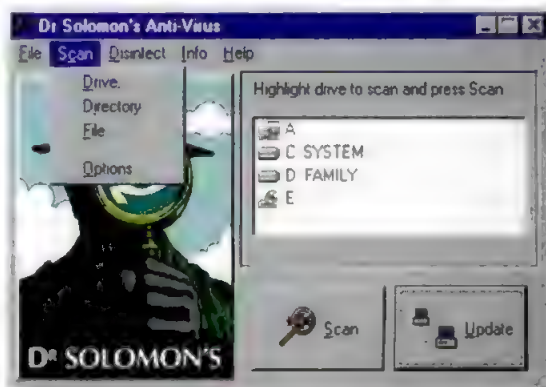
In contrast to DSAV's simple interface, AVTK's UI is disorganized and unintuitive—perhaps as a result of features being cobbled onto it over time. As with IBM AntiVirus, AVTK's corporate users may forgive UI shortcomings, but end users will look to products that are easier to use.

AVTK's scheduler lets you define scans for drives and folders, but not for individual files or groups of files. The options for configuring scans are more limited than in most other products. In addition, the help file is poor and contains only four topics, one of which directs you to the manual.

The performance for both programs was acceptable, except for compressed file scanning. Both products were slow

with this, and DSAV scanned only a portion of the decompressed files.

Dr Solomon's Anti-Virus 7.79, Anti-Virus Toolkit for Windows 95 7.79. List price: DSAV, \$49.95; AVTK, \$125. Requires: 486-based PC or better, 8MB RAM, 4MB to 5MB hard disk space, Microsoft Windows 95. Dr Solomon's Software Inc.,



UNLIKE OTHER PRODUCTS, Dr Solomon's lets you select the type of scan from the main menu.

Burlington, MA; 800-590-8226, 781-273-7400; www.drsolemon.com. Choose 561 at www.pcmag.com/infolink.

ESAFE TECHNOLOGIES INC.

eSafe Protect

A new entry in the U.S. market, eSafe Protect 1.02 (\$49 list), comes from parent EliaShim, an Israeli company that has been making antivirus products for ten years. Quarterdeck Corp.'s ViruSweep uses the same scanning technology, so EliaShim is represented twice in this roundup.

eSafe Protect is more than antivirus software. It also protects your system from vandals and online threats from the Internet (Java applets, ActiveX controls, plug-ins, and modem dialers). The full product is reviewed in this issue's roundup of security suites, "Defend Against Invaders," and it won our Editors' Choice.

Performance was slightly above average, and eSafe's task-oriented interface shows promise, but the program has problems. Real-time scanning is difficult to disable and the on-demand scanner cannot scan individual files. More important, it missed four macro viruses on our tests, making its virus protection the weakest in this roundup.

Although we found eSafe Protect's interface attractive and engaging, the multiple dialogs are confusing. You can launch the real-time scanner by either



selecting the Run eSafe Anti-Virus icon from the eSafe Protect group on the Start menu or clicking on the Protect Watch module desktop icon.

Launching the scanner activates a third, task-oriented dialog, which appears in the main screen where you create tasks. A combo box lists existing tasks and a tabbed dialog lets you select options, including the scheduler. Since you can save tasks for reuse, it's easy to create and save a scan for a folder containing multiple word processing documents, for example.

eSafe lets you scan drive and folder sets on demand but not individual files. You can scan groups of files, however, that you select by file type, and groups of files can be excluded by extension, globally.

The well-organized and detailed help file is one of the best we've seen in this roundup. eSafe also makes excellent use of the Windows 95 What's This? help button and provides lucid explanations.

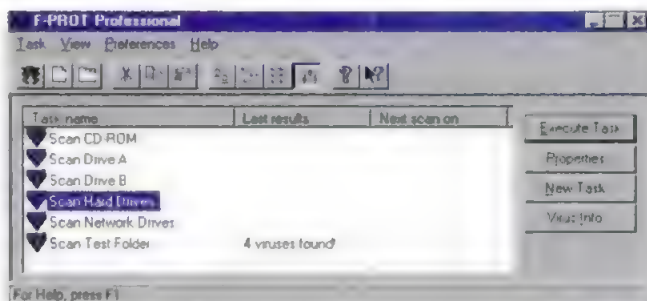
eSafe Protect 1.02. List price: \$49. Requires: 486-based PC or better, 8MB RAM, 5MB hard disk space, Microsoft Windows 95. eSafe Technologies Inc., Seattle; 800-477-5177, 206-524-9159; www.esafe.com. Choose 562 at www.pcmag.com/infolink.

COMMAND SOFTWARE SYSTEMS INC.

F-Prot Professional

F-Prot Professional 3.01 (\$49.95 list) shows a good deal of potential, but it still has a way to go before it can be a strong contender in the antivirus market. Although its performance was slightly above average and we liked the detailed Explorer-like interface, its task-oriented capabilities are extremely limited compared with the same features in the other packages. As a result, F-Prot's capabilities are more akin to the drive-oriented programs.

The user interface follows many Explorer and Windows conventions all too often missed by other products. For instance, a button that contains text followed by an ellipsis will bring up a subordinate dialog, and a dialog without one invokes the action immediately. This gives F-Prot one of the more intuitive interfaces in the roundup.



F-PROT HAS ONE OF THE BEST task-oriented interfaces, presented in a crisp, easily understood main window.

EDITORS' Choice

→ Norton AntiVirus 4.0

This year's field is full of innovative products that hit the mark in many areas. The best combination of virus protection, performance, and usability comes from one of the most mature products on the

market, Symantec Corp.'s Norton AntiVirus (NAV) 4.0.

NAV provides the best end-user experience of the products we tested.

The package includes four informative videos, and installation and setup were among the easiest of the tested products. NAV's drive-oriented interface provides a rich set of scanning options, presented in a clear, well-organized manner.

As satisfied as we were with NAV's showing, we hope to see improvements in its ability to scan groups of files or folders, improved documenta-

tion, and a scheduler that's easier to use. To remain competitive, we expect that Symantec will need to replace the drive-oriented interface with a task-oriented version in the near future. Nevertheless, NAV is the best package available today.

Although most task-oriented programs show promise, they're still immature, and many fall short in areas such as file scanning and scheduling, as well as in performance and virus detection. The exception is the first-generation Viru-Sweep 1.0, from Quarterdeck Corp., which earns an honorable mention.



The Task Properties dialog makes it simple to configure scans. Unfortunately, the actions these tasks can take on files, folders, and drives are limited. Although you can select collections of drives or drive paths for scanning, there's no facility for selecting collections of files or folders for scanning—a notable limitation.

You can configure on-demand scans by the inclusion or exclusion of file types, but this feature can only be implemented globally. This means the file types you include or exclude will be applied to each subsequent task you create, which runs counter to the idea of task-oriented functionality. In the future, we would like to see the exclusions/inclusions facility built

into the Task Options dialog.

F-Prot calls real-time scanning “dynamic virus protection.” Unlike ThunderByte, F-Prot does not define real-time scans as regular tasks but as separate actions launched in a separate dialog. We found this extra dialog unnecessary and would have preferred to run real-time scans from the same Task Properties dialog.

F-Prot Professional 3.01. List price: \$49.95. Requires: 486-based PC or better, 8MB RAM, 4MB hard disk space, Microsoft Windows 95. Command Software Systems Inc., Jupiter, FL; 800-423-9147, 561-575-3200; www.commandcom.com. Choose 563 at www.pcmag.com/infolink.

IBM CORP.

IBM AntiVirus

Although the drive-oriented IBM AntiVirus 3.0.1 (\$49 list) boasts excellent documentation and scanning speed, its user interface needs improvement. IBM repackaged this corporate product in a clever retail presentation complete with a picture of virus monsters trapped in a locked chain. And although the product's business users may appreciate IBM AV's

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Another Approach to File Protection

➔ Integrity Master's cryptographic signatures provide a unique way to guard against hostile invaders. The software gives every file on your system an ID that you can track to prevent unwanted changes.

Although most antivirus programs on the market today have some means of detecting unknown viruses, their primary method is based upon prior knowledge of the virus and how it modifies files. This requires that the software be kept constantly up to date.

Stiller Research's Integrity Master takes a different approach to the problem. Integrity Master creates a "cryptographic signature" based on several file characteristics for each file on your hard disk. Any change to the file will change the signature, alerting the user to a possible infection.

Unlike the other programs in this roundup, Integrity Master is a character-based DOS application, although it will run under Windows 3.1, Windows 95,

Windows NT, and OS/2. The program gives a tremendous amount of information during both installation and use, which non-power users might find verbose and over their heads.

During installation, Integrity Master looks at every file on the user's local drives and creates a cryptographic signature for each one. The program also scans for known viruses, a necessary step since signature checking will not detect files already infected.

The program claims to work under Windows, but we found that it couldn't open several system files in use by other applications. You're better off rebooting to DOS and scanning there. If you want scheduled system scans, you'll need to add some commands to your system's Autoexec.bat or log-on

script. Although the documentation is sufficient for a power user, an average Windows 95 user might get lost in the DOS procedures.

Because Integrity Master detects all changed files, the program has nonvirus uses as well. For instance, the program will identify files that changed due to disk corruption or inadvertent or malicious modification.

We were impressed with the detailed reports Integrity Master generates. They are invaluable to power users but overkill for average users. The reports highlight all changed files as well as errors the program encountered and give possible reasons for them. We think readers will also find the program's manual extremely helpful for understanding virus-

es, myths, and the strengths and weaknesses of various antivirus strategies.

Many users may find the comprehensive analysis quite beneficial. Since Integrity Masters lacks a real-time scanner and the ability to remove viruses from infected documents, however, we can only recommend the utility as a supplement to one of the other programs reviewed here.

—Ben Z. Gottesman

Integrity Master 3.21a. List price: \$49.50. Requires: 400K RAM; 1MB hard disk space; DOS 2.1 or later; Microsoft Windows 3.x, Windows 95, or Windows NT. Stiller Research, Colorado Springs, CO; 800-242-4775, 719-533-1879; fax, 719-533-1728; www.stiller.com. Choose 572 at www.pcmag.com/infolink.

minimalist interface and unobtrusive background scanning, end users will likely find the package unintuitive and confusing. The product also failed to detect one macro virus on our tests.

Installation was fairly simple. We enabled the Custom installation option with the background scanning component, System Shield, which was activated. We found that System Shield does not always activate during the installation process, however. You may need to take an extra step and edit the Autoexec.bat file. You can also edit this file to remove the component.

The user interface consists of one gray button on a gray background. The default setting scans the executable files on all local hard disks, but there is no visible indication of the process, making it difficult to know the status of the scan.

The main menu is very simple but unintuitive to use. For example, the Check fea-

ture lets you configure on-demand scans, and the Setup feature lets you configure System Shield and scheduling. IBM AV performs one scheduled scan at a time.

Although most products we tested let you control the background scanner through an icon in the system tray, IBM's scanner is controlled by a configuration setting only. An icon is displayed in the tray but does not indicate whether the scanner is activated.

The product's performance was in the top tier, and it is notably faster than the competition when decompressing and scanning compressed files. We consider IBM's manual to be a model for others to emulate, with excellent, useful content and a well-organized index. The contents of the help file are equally impressive, but could use better organization.

IBM AntiVirus 3.0.1. List price: \$49. Requires: 486-based PC or better, 8MB RAM, 4MB

hard disk space, Microsoft Windows 95. IBM Corp., Sterling Forest, NY; 800-742-2493, 512-434-1554; www.av.ibm.com. Choose 564 at www.pcmag.com/infolink.

COMPUTER ASSOCIATES INTERNATIONAL INC.

InocuLAN AntiVirus for Windows 95

Although several innovative capabilities distinguish the drive-oriented InocuLAN AntiVirus 5.0 for Windows 95 (\$69 list), the product's poor performance counters the effect. Recently acquired from Cheyenne Software, InocuLAN turned in the slowest scores on our scanning tests and missed one macro virus. But like eSafe, InocuLAN is a well-conceived program, and a few improvements could turn it into a strong competitor.

InocuLAN's main screen presents a Windows outline control where you select any combination of drives and folders for

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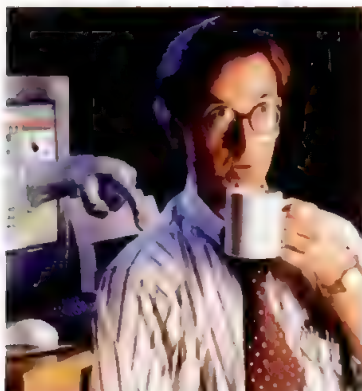
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References and Additional Information

1. Hundreds of thousands of satisfied Quantex customers
2. Quantex Business Consultants at (800) 346-6572
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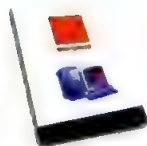


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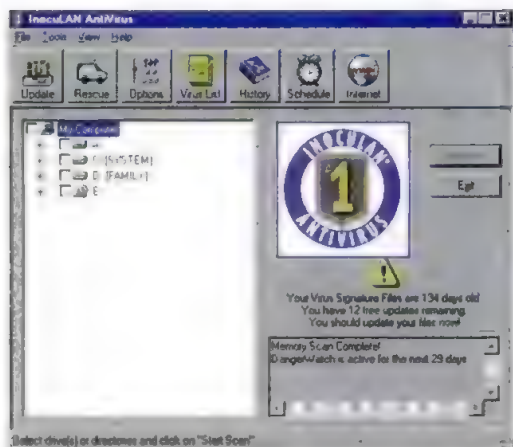
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Antivirus Software



INOCULAN'S EXPLORER-LIKE main window includes a box describing the results from the most recent action.

on-demand scanning. You cannot select individual files to scan from here, though; you must select the Scan File(s) option on the main menu to bring up another Explorer window. We would have preferred to select all our media from the same Explorer window.

As part of a good set of options, Inoculan features a sophisticated exclusion mechanism that is superior to others we've tested. Although the drive-oriented interface dictates that you set exclusions globally, Inoculan gives you granular control over them. You can exclude individual files and folders by name and groups of files by file extension.

We liked the program's task-oriented scheduler, which is unfortunately controlled by a wizard that forces you to take multiple steps to accomplish even simple

tasks. Also, changing a schedule requires you to rerun the wizard from the beginning. We would prefer the addition of a conventional properties page so users can make quick changes.

A unique feature lets you move infected files into the quarantine area, a folder that can be excluded from subsequent scans. This prevents triggering alerts on files known to be infected during all scans. This feature also lets you corral infected files in one location for further examination.

Another notable feature includes a button for setting the most rigorous level of protection. Also, a Danger Watch option automatically sets the highest level of protection whenever an infection is detected. Danger Watch expires after a preset period of time and returns the program to your preferred protection level. **Inoculan AntiVirus 5.0 for Windows 95.** List price: \$69. Requires: 486-based PC or better, 8MB RAM, 8MB hard disk space, Microsoft Windows 95. Computer Associates International Inc., Islandia, NY; 800-424-3936, 516-342-5224; www.cai.com/cheyenne. Choose 565 at www.pcmag.com/infolink.

NETWORK ASSOCIATES INC.

McAfee VirusScan

A old-timer in the antivirus industry, McAfee Associates is now known as Network Associates. Although its latest AV

release, McAfee VirusScan 3.1.1 (\$49 list), demonstrates multiple enhancements geared toward increasing usability and approachability, the result is a confusing triad of independent interfaces. Furthermore, Network Associates needs to tune VirusScan's performance: The program turned in some of the slowest scan speeds again this year.

VirusScan is three user interfaces in one. The default interface is the Classic, but you'll also find the drive-oriented Advanced, and beyond that, you'll discover the task-oriented interface, AV Console. We found AV Console to be the most feature-rich and easy to use of these, but there is no way to configure it as the default interface, a disappointing limitation.

Each interface provides comprehensive antivirus protection. Classic is the most basic and allows drive-oriented, on-demand scans of a single drive or folder or all files or folders. The Advanced interface offers more granularity, with a tab for selecting drive, folder, and file exclusions. You can also select drives and folders from an Explorer-like dialog, but you need to enter individual files or wildcard specifications manually.

The Advanced interface also includes a corporate feature called Alert, which sends a message over the network to notify administrators of the presence of a virus.

In essence a general-purpose scheduler for use in launching any program, AV Console's powerful and feature-laden interface is the best of the three and deserves the

SUMMARY OF FEATURES

Antivirus Software

	Dr Solomon's Anti-Virus 7.79	Dr Solomon's Anti- Virus Toolkit for Windows 95 7.79	eSafe Protect 1.02	F-Prot Professional 3.01	IBM Anti-Virus 3.0.1	Inoculan AntiVirus 5.0 for Windows 95	McAfee VirusScan 3.1.1
■ YES ■ NO							
List price	\$49.95	\$125.00	\$49.00	\$49.95	\$49.00	\$69.00	\$49.00
Includes or makes rescue disk	■	■	■	■	■	■	■
Scans during installation	■	■	■	■	■	■	■
Scans boot sector	■	■	■	■	■	■	■
Makes backup of master boot record	■	■	■	■	■	■	■
Opens and scans compressed files	■	■	■	■	■	■	■
Scans memory	■	■	■	■	■	■	■
Schedules automatic scans	■	■	■	■	■	■	■
Scans files on access	■	■	■	■	■	■	■
Scans by file type	■	■	■	■	■	■	■
Performs background scans	■	■	■	■	■	■	■
Detects and removes macro viruses	■	■	■	■	■	■	■
Reports results on-screen/in file log	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Updates available on the Internet	■	■	■	■	■	■	■
Automated updates available	■	■	■	■	■	■	■

spotlight as the program's default (or perhaps only) interface. We liked the fact that when minimized, AV Console resides in the system tray, not the taskbar. But the program also has its share of minor user-interface glitches. For example, clicking on the *X* in the upper-right corner disables the scheduler without warning.

True to its shareware heritage, the VirusScan retail package's limited printed documentation consists only of a Quick-Start guide and lacks a manual. Unfortunately, the merely average help file does not compensate for these deficiencies.

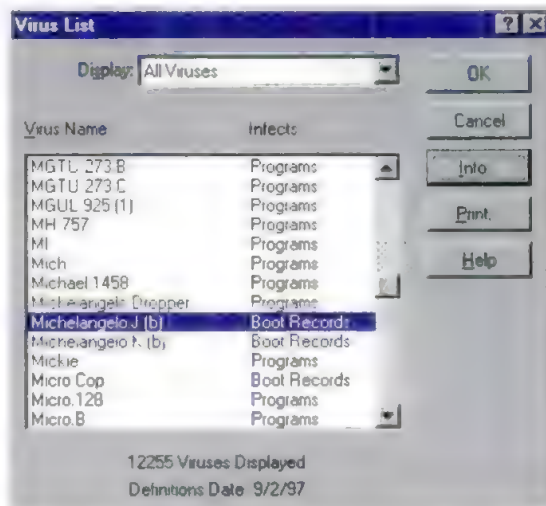
McAfee VirusScan 3.1.1. List price: \$49. Requires: 486-based PC or better, 8MB RAM, 5MB hard disk space, Microsoft Windows 95. Network Associates Inc., Santa Clara, CA; 408-988-3832; www.networkassociates.com. Choose 566 at www.pcmag.com/infolink.

SYMANTEC CORP.

Norton AntiVirus



With four well-produced videos that provide a high level of comfort for the end-user and the easiest setup and installation of the products in this roundup, Norton AntiVirus (NAV) 4.0 (list prices: standard, \$49.95; deluxe, \$69.95) is the most approachable product we reviewed. Excellent antivirus protection, good performance, and a simple, streamlined user interface earned NAV our Editors' Choice.



LIKE MOST OF THESE PACKAGES, Norton AntiVirus includes a list of viruses known to the program.

We appreciated NAV's many strengths, but poor documentation and interface limitations make the drive-oriented NAV vulnerable to task-oriented competitors such as ThunderByte, VirusScan, and ViruSweep. NAV will soon require an interface overhaul to retain its market share.

The installation was simple yet sophisticated. We were impressed when the install detected the presence of the Norton Utilities, which include an antivirus scanner, then reported that the AV software was out of date and recommended that we replace it with NAV.

NAV's interface is straightforward and simple to use. The on-demand scanner lets you include drives from the visual portion of the main screen and control the scan

through an elaborate suite of options. Exclusions can include folders, wildcard specifications, and individual files. Unfortunately, the Scan command on the main menu lets you scan only one file or folder at a time, a surprising limitation in light of the competition.

NAV is bundled with Symantec's general-purpose scheduler, which can run any program, scan for viruses, or run the Live Update! component of NAV to receive virus updates. Whereas other schedulers let you enter options through a GUI, NAV requires you to enter them in the command line,

a task many users will find difficult. Moreover, command format isn't described in the scheduler section of the manual and is omitted from the help files, which we found below average.

The print documentation has three sections for support: for Windows 3.1/DOS, for Windows 95, and for Windows NT. The Windows 95 section comprises only 30 pages, with few illustrations or step-by-step guides. The online support from Symantec's Anti-Virus Research Center (SARC) is outstanding, however. **Norton AntiVirus 4.0.** List price: Standard, \$49.95; deluxe (with two years of program upgrades), \$69.95. Requires: 486-based PC or better, 16MB RAM, 12MB hard disk space, Microsoft Windows 95. Symantec Corp., Cupertino, CA; 800-441-7234, 541-334-6054; www.symantec.com. Choose 567 at www.pcmag.com/infolink.

TOUCHSTONE SOFTWARE CORP.

PC-cillin

The drive-oriented PC-cillin 3.0 (\$44.99 list) is a mixed bag. Unique features include convenient check boxes and a built-in update utility. Unfortunately, the program had interface quirks and performance problems, which included system hangs, and it missed a macro virus on our tests.

PC-cillin can scan drives and folders on demand but not individual files or groups of files. The scheduler lets you set one scan at a time and can include individual files or groups of files by extension. PC-cillin's real-time scanner can include files by extension and exclude them by directory.

See www.pcmag.com for interactive views



Norton AntiVirus 4.0 PC-cillin 3.0

ThunderByte Anti-Virus Utilities 8.03a

Vet Premium Anti-Virus 9.6

VirusSweep 1.0

\$49.95

\$44.95

\$69.95

\$65.00

\$39.95

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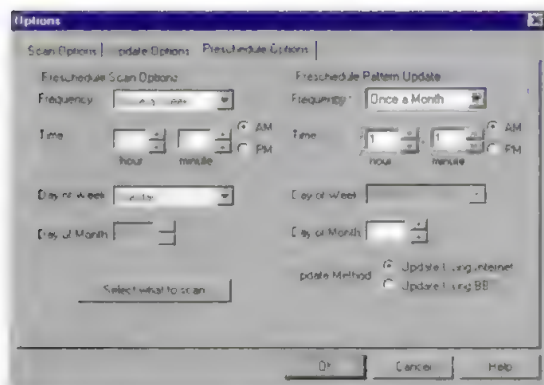
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PC-CILLIN'S SCHEDULING DIALOG is typical of most of the products but slightly more crowded.

The main interface contains three easy-to-use check boxes to launch commonly run scans. Simply click on All Local Drives in My Computer to scan these, for example. Other check boxes let you scan the boot and root area and all network drives.

PC-cillin includes some notable features. The Internet Virus Lab contains a built-in Internet browser that connects with online resources that include the "virus doctor," a service that lets you send uncleanable files to TouchStone. If the company can clean the file, TouchStone will do so for free. This is a clever mechanism that enlists users to help TouchStone uncover new viruses. An Update Pattern tab lets you download free updates from the Web or TouchStone's BBS.

PC-cillin suffered performance problems in formal and informal testing. It took the longest to launch and crashed our system each time we loaded the Smart Monitor with two other resident utilities. Although the problems were relatively minor, they were unique to PC-cillin. Though its speed was acceptable, its real-time scanner caused a 7 percent system performance decrease, the largest in the roundup.

PC-cillin 3.0. List price: \$44.95. Requires: 486-based PC or better, 8MB RAM, 12MB hard disk space, Microsoft Windows 95. TouchStone Software Corp., Huntington Beach, CA; 714-969-7746; www.touchstonesoftware.com. Choose 568 at www.pcmag.com/infolink.

NOVASTOR-AUTHENTEX SOFTWARE CORP.

ThunderByte Anti-Virus Utilities

Although the task-oriented ThunderByte Anti-Virus Utilities (TBAV) 8.03a (\$99 list) distinguished itself by posting the fastest scanning speeds in the roundup, the

program lacks a scheduler and missed a macro virus in testing. Additional feature enhancements as well as improvements to the user interface are needed to put ThunderByte in the same league as the rest of the products in this roundup.

From the main Explorer-like window it is easy to configure or edit a scan (or "target," in ThunderByte's lingo). You can define on-demand scan tasks for the boot disk drive, all local hard disks, all CD-ROM drives,

and all drives. Clicking on the Edit Target or New Target button transforms the main screen into the task-editing screen. From there, however, you can only add task items individually; we felt the ability to make multiple selections would speed the process.

Although the program lacks a scheduler, the strong real-time scanner makes it feasible to perform on-demand scans less frequently than you otherwise might. We found configuring this feature extremely easy, and because it let us set up defined tasks, we could also execute pinpoint scans simply by defining a task.

Unfortunately, the user interface includes some confusing conventions. For instance, there is no scan button to launch a scan; instead, you need to double-click on an item in the main screen. There are also five buttons on the left side of the main window; some open subsequent dialogs and others start tasks. But because TBAV doesn't follow the Windows convention of using an ellipsis to differentiate between the two, their capabilities are unclear. In addition, the Setup dialog initializes the program instead of configuring the current scan.

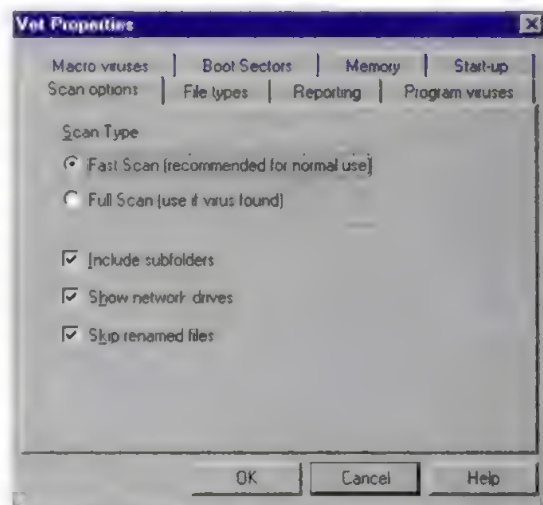
ThunderByte Anti-Virus Utilities 8.03a. List price: \$99. Requires: 386-based PC or better, 4MB RAM, 5MB hard disk space, Microsoft Windows 95. NovaStor-Authentex Software Corp., Kanata, Ontario, Canada; 800-667-8228, 613-930-4444; www.authentex.com. Choose 569 at www.pcmag.com/infolink.

CYBEC PTY LTD.

Vet Premium Anti-Virus

Like eSafe Protect, Vet Premium Anti-Virus 9.6 (\$65 list) is a new entry in the U.S. market. The product comes from Australia, where it is well known. Our tests proved Vet to be lacking in a number of areas, however. The utility demonstrated above-average speed, but it failed to scan compressed files or check the floppy disk drive at shutdown, making the system more vulnerable to boot-sector viruses. User interface quirks and the lack of a scheduling capability make Vet a product in need of additional work before it can compete successfully in the United States.

When preparing a scan, you can only select as many folders and files as you see in the current Explorer list box, an annoying limitation. For example, you can't



VET'S PROPERTIES DIALOG looks comprehensive but contains fewer options than the best products do.

select both the Windows System Folder and a second folder that resides at the root of the directory; any selections made in one folder disappear as soon as you leave it.

You can only scan files using a limiting inclusion method. Vet scans either all files or only selected file types. Since it's not readily apparent which file types viruses can infect, Vet's capability is less safe. Although scanning all files is the safest way, you may sometimes want to select which scans you want. We would prefer the program to exclude the file types known not to be infected rather than to add file types thought to be vulnerable.

Like ThunderByte, Vet lacks a scheduler. But whereas ThunderByte's robust real-time scanner makes up for the omis-

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While Compaq's 8-way server languishes in a six-month countdown, HP's LXr Pro 8 has already left the pad. Optimized for the NT operating system, the HP LXr Pro 8 is the first server from a top-tier vendor to deliver the 8-way Intel® Pentium® Pro processor, and the only server to deliver the next generation of I/O throughput with I2O disk array technology. It's one small step for HP, one giant leap for IT. Visit us at www.hpresource.com/lxrpro8 or call 1-800-533-1333.

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PERFORMANCE TESTING

Antivirus Software



Although speed and usability are important factors in selecting antivirus software, they mean nothing if the product misses a virus.

What the Numbers Mean

This year we tested only antivirus products that have been certified by the International Computer Security Association (ICSA). Formerly known as the National Computer Safety Association (NCSA), the ICSA is an independent organization that tests and certifies antivirus, firewall, and Internet security software. To be certified, antivirus products must detect 100 percent of all viruses found on the WildList. Compiled by Joe Wells, an antivirus industry consultant, WildList viruses are those known to have infected a computer outside the laboratory environment. In addition, certified products must also detect 90 percent of Zoo, or laboratory-created viruses. These

results are less significant than the real-world test scores, however.

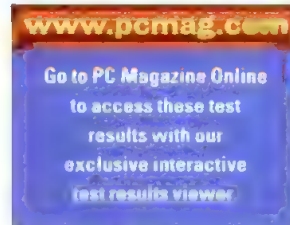
We also contracted with the ICSA to perform some additional tests. Although certified products will detect macro viruses during a drive scan, we wanted to test other behaviors, including whether the products could detect macros upon opening an infected file, how the programs install on an already infected system, and whether they detect the presence of a floppy disk at shutdown.

The **Macro Virus** test resulted in five products missing macro

viruses. The weakest protection came from eSafe Protect, which failed to detect four viruses. Four products each missed one virus: IBM AntiVirus, InocuLAN AntiVirus for Windows 95, PC-cillin, and ThunderByte Anti-Virus Utilities. Although macro viruses range in their destructiveness,

many can be as dangerous as file viruses. And because it only takes one virus to wreak havoc on a system, these results are significant and strongly influence our evaluation of these products.

The **Installation** test is important because installing an antivirus program on an already infected system can affect the program's ability to protect the system as well as damage the AV product itself. All the products except F-Prot scanned the system upon installation. eSafe did not detect the virus InocuLAN and Virus-



	Disinfection Macro viruses missed ▼	Scanning Program files (files per second)	All files (files per second)	Compressed files (files per second)	Performance Decrease (measured with Winstone 98) ▼
▼ Low scores are best. Bold type denotes first place.					
Dr Solomon's Anti-Virus:	0	35.6	37.8	0.80	2%
Dr Solomon's Anti-Virus Toolkit for Windows 95	0	35.5	37.0	0.26	2%
eSafe Protect	4	36.6	36.5	1.09	2%
F-Prot Professional	0	37.8	43.7	0.33	1%
IBM AntiVirus	1	55.7	38.1	1.12	1%
InocuLAN AntiVirus for Windows 95	1	15.1	20.6	0.33	0%
McAfee VirusScan	0	18.0	17.4	0.38	1%
Norton AntiVirus	0	30.2	39.2	0.25	1%
PC-cillin	1	32.1	30.5	0.31	7%
ThunderByte Anti-Virus Utilities	1	58.4	63.8	0.04	1%
Vet Premium Anti-Virus	0	41.8	48.6	N/A	5%
VirusSweep	0	41.1	38.7	0.49	1%
		BETTER ►	BETTER ►	BETTER ►	

N/A—Not applicable: This product does not scan compressed files.

sion somewhat by lessening the need for periodic full scans, Vet's real-time scanner is rudimentary and checks files only as they open and close. Here, the lack of a scheduler requires you to perform occasional full scans manually in order to ensure the safety of your system.

Vet Premium Anti-Virus 9.6. List price: With quarterly program updates, \$65. Requires: 486-based PC or better, 4MB RAM, 2.2MB hard disk space, Microsoft Windows 95. Cybec Pty Ltd, Melbourne, Victoria, Australia; 61 3 9825 5600; www

.vet.com.au. U.S. support from Ontrack Data International Inc., 800-872-2599. Choose 570 at www.pcmag.com/infolink.

QUARTERDECK CORP.

VirusSweep

Quarterdeck licensed EliaShim's virus-scanning engine for its debut in the AV field with VirusSweep 1.0 (\$39.95 street). The program's fine performance and easy-to-use interface make it an impressive first-generation offering. A few enhancements to the task-oriented inter-

face and some expansion of the help files will make VirusSweep a formidable challenge to the established market players. For these achievements, the program earns an honorable mention.

Quarterdeck has made many improvements to the eSafe Protect interface. VirusSweep retains eSafe's main screen, which launches the dialogs (and includes the Quarterdeck logo, of course), but the company has removed the green control panel in favor of a traditional Windows dialog called VirusSweep Watch. We prefer

Scan each cleaned the virus during installation. Although this method is difficult to perform reliably, it does save time. IBM AntiVirus and Norton AntiVirus aborted the install and then cleaned the virus. Four products—Dr Solomon's Anti-Virus (DSAV) and Dr Solomon's Anti-Virus Toolkit for Windows 95 (AVTK), ThunderByte Anti-Virus Utilities, and Vet Premium Anti-Virus—detected the virus, but only after the installation was complete and the system was rebooted.

The **Floppy Disk Detection** test shows whether the software alerts you to the presence of an inserted floppy disk at shutdown. This is a useful feature because boot-sector viruses are often spread when a system is started with an infected floppy disk in the drive. The Dr Solomon products and Vet were the only products that failed this test. Of the products that passed, all but eSafe Protect also scanned the floppy disk.

Next to virus protection, speed is a consideration in choosing antivirus software. We ran scanning tests at PC Magazine Labs to determine how long various scans took and a performance test to determine whether background scanning slowed system performance. All products except ThunderByte and Vet include robust scheduling features, but even a good scheduler will not offset slow performance. Although the scheduler lets you run your scans at 3 A.M., you'll need to leave your system on all the time, and this may not be practical. Alternatively, if you schedule your scan as the first event in the morning or at lunchtime and it takes an unacceptably long time to run, you might be tempted to disable it.

For the **Program Files Scanned** test, we measured the length of time it took to scan program files on the system. Because all AV products do not identify program files the same way, this resulted in a wide range of program files being scanned in each program—from 1,380 scanned by eSafe to 2,059 files by ThunderByte. Because measuring scan length would give an unfair advantage to products that scanned fewer files, we measured the products by the number of files per second they scanned, which provided a more accurate performance picture. The best performers were IBM AntiVirus and ThunderByte Anti-Virus Utilities.

Since program scanning alone isn't always effective for catching macro viruses, our **All Files Scanned** test measured how long it took each product to scan all the files on the system. ThunderByte was considerably faster than the other products, scanning 63.63 files per second. The next closest score came from Vet, with 46.56 files per second. On the other end of the spectrum, McAfee VirusScan and Inoculan were the slowest, taking three times longer to complete the scan than ThunderByte, with 17.39 files per second and 20.64 files per second, respectively. The next-fastest product was F-Prot Professional, which scanned 43.66 files per second.

VirusSweep's use of standard Windows conventions and the all-around crisper presentation. For instance, the VirusSweep Watch interface displays all the tasks (called "sets" in VirusSweep) that are scheduled for real-time operation and makes them easy to configure with the click of a button.

VirusSweep shares the same task-oriented functionality as eSafe, including the scheduler. Although we prefer the task-oriented programs, we would have liked the ability to select individual files for on-demand scans, a feature lacking in

both programs.

Since VirusSweep uses the EliaShim scanning engine, we expected both programs to deliver identical test results. eSafe missed four of our test viruses, however, while VirusSweep detected them all, which suggests that Quarterdeck has done more than just wrap its interface around eSafe's core product. Quarterdeck also made some modifications to eSafe's help file, but the results were less impressive, with fewer topics and a briefer index.

Viruses often enter your system as compressed files, such as e-mail attachments or as ZIP files downloaded from the Web. On the **Compressed Files** test, eSafe and IBM were top performers, decompressing and scanning files in less than half the time of the competition, on the average. And although ThunderByte has recently added the ability to scan compressed files, this function is quite slow. Dr Solomon's products turned in differing results: Dr Solomon's Anti-Virus and Dr Solomon's Anti-Virus Toolkit were both slow but were both able to scan the 5 compressed files. Upon decompression, however, DSAV scanned only 41 of the 125 files. Vet does not scan zipped files but rather the file during the decompression process only. This method won't prevent you from passing an infected ZIP file to someone else, however.

Our **Performance** test determined how antivirus scanning affects system performance. Although most products slowed the system by only 1 or 2 percent, PC-cillin slowed it by 7 percent, and Vet by 5 percent. Inoculan's scanning resulted in no noticeable performance difference. Note, though, that most performance hits under 10 percent are hard to discern.—*Analysis written by Kristina De Nike*

How We Tested

The test-bed system was a 200-MHz Micron Millennium Pentium with 32MB of RAM, with Microsoft Windows 95, MGI PhotoSuite 8.05, Microsoft Money 98, and Microsoft Office 97 installed. The data in these programs consisted of more than 1,000 documents and spreadsheets.

For the **Macro Virus** test, the ICSA launched files infected with 62 different macro viruses. The files were opened from the C: drive, first from within the application and then through Internet Explorer.

For the **Installation** test, the Monkey virus was put on the system prior to the installation of the antivirus programs, which then checked whether the application ran a system scan prior to installation. For the **Floppy Detection** test, the ICSA installed the software then shut down a system with a floppy disk left in the drive.

For the **Program Files** test, we set the antivirus packages to scan for programs on a partition with applications and data files. We timed the scan and noted the file types the antivirus package scanned for. Then we searched the hard disk to determine the number of files the product checked. For the **All Files** test, we scanned the full partition of the hard disk then searched the drive similarly. For the **Compressed Files** test, we scanned 5 zipped files located in a partition separate from the other test files. Each ZIP file contained 120 files with subdirectories.

For the **System Performance** test, we ran Winstone 98 on our test system before and after we installed the antivirus software.

For virus updates, Quarterdeck has recently launched its Web-based service, Quarterdeck Anti-virus Research Center (QUARC). At the time of this writing, however, the service presented only a small amount of additional information. **VirusSweep 1.0.** List: \$39.95. Requires: 386DX-based PC or better, 8MB RAM, 8MB hard disk space, Microsoft Windows 95. Quarterdeck Corp., Marina del Rey, CA; 800-683-6696, 813-523-9700; www.quarterdeck.com. Choose 571 at www.pcmag.com/infolink. PC

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	V115	Q100	V85	V775	V773	Q71	V865	Q53	Q51	Q41
Size/Viewable	21"/20.0"	20"/18.4"	19"/18.0"	17"/16.0"	17"/16.0"	17"/16.0"	15"/13.8"	15"/13.8"	15"/13.7"	14"/13.2"
Dot Pitch	0.26mm	0.28mm	0.26mm	0.26mm	0.26mm	0.28mm	0.28mm	0.28mm	0.28mm	0.28mm
Max. Resolution	1600 x 1200	1600 x 1200	1600 x 1200	1600 x 1200	1280 x 1024	1280 x 1024	1280 x 1024	1280 x 1024	1024 x 768	1024 x 768
Optimum Resolution	1280 x 1024	1280 x 1024	1280 x 1024	1280 x 1024	1024 x 768	1024 x 768	1024 x 768	1024 x 768	800 x 600	800 x 600
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TROUBLESHOOTING UTILITIES

SOLVE PC problems

Here's an array of tools and suites to help you fix what's ailing your PC or let you fine-tune your system for better performance. By Barry Simon

No doubt the inventor of the abacus got splinters in his fingers. In every generation of computer systems, knowing how to get out of trouble and stay out has been part of coping with the new technology. Even with today's "smarter" hardware and operating systems, troubleshooting utilities remain an essential part of personal computing.

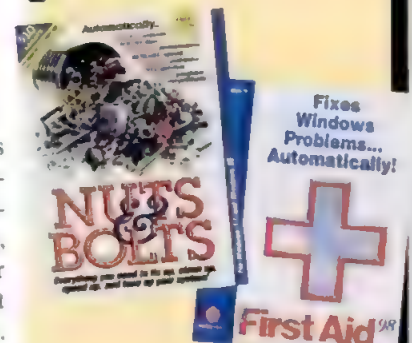
For the purposes of this story, we include a range of products under the head-

ing of *troubleshooting*, including programs that diagnose and report on hardware-based problems as well as software problem solvers. In addition to troubleshooting, several of these utilities also help keep your system running in top shape and prevent problems from occurring in the first place.

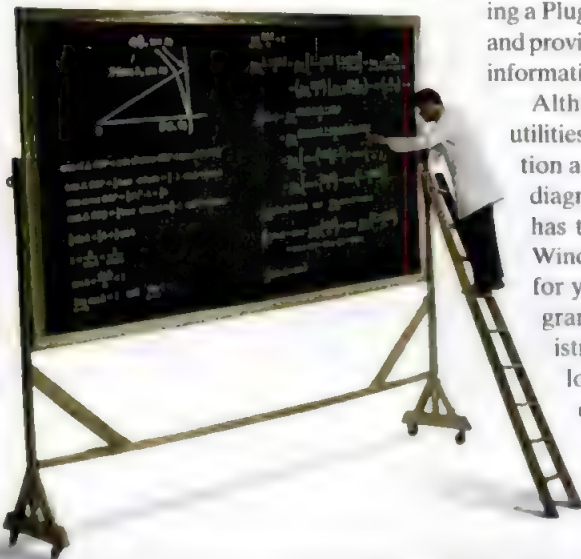
Traditionally, hardware tools focused on diagnosing and reporting on IRQs and DMA channels—information that you needed in order to set jumpers on new adapters properly. The arrival of Microsoft Windows 95 changed all that by establishing a Plug and Play standard for hardware and providing the user with IRQ and DMA information via the Device Manager.

Although hardware-troubleshooting utilities still provide a wealth of information and unique features such as SCSI diagnostics, software troubleshooting has taken center stage. In this area, Windows 95 still leaves plenty of room for you to get into trouble: Old programs leave unwanted files or registry entries behind; shared files get lost in the shuffle, crippling applications; and performance begins to lag as disks become fragmented. Troubleshooting utilities address these problems and many more.

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Troubleshooting Utilities

For this roundup we looked at seven products. Two of them, TouchStone Software Corp.'s CheckIt version 5 and American Megatrends' PC Care 97, are traditional hardware diagnostics and reporting tools. At the opposite end of the spectrum are CyberMedia's First Aid 98, Symantec Corp.'s Norton CrashGuard Deluxe, and Quarterdeck Corp.'s RealHelp Extra Strength, which focus on fixing software-related problems. Finally, Symantec's Norton Utilities 3.0 for Windows 95 and Network Associates' Nuts & Bolts are suites that offer a laundry list of features for solving problems and optimizing your system.

The products' capabilities can make them an essential addition to your computing arsenal. Crash protection, for instance, works in the background, letting you save your work and shut down safely when disaster strikes. This feature can be a lifesaver if you've forgotten to save that report you've been working on for a couple of hours.

Often you face the opposite problem in Windows: Files you want to get rid of just won't go away. This can slow performance and cause crashes. Both Norton Utilities and Nuts & Bolts solve this problem by compressing the registry. System tune-up is also a critical component of troubleshooting. All the programs reviewed here except PC Care 97 offer some tune-up tools.

If you plan to buy just one troubleshooting utility, you'll probably be best served by a comprehensive troubleshooting suite such as Nuts & Bolts, which edged out Norton Utilities for the first time this year. If you don't want to spend a lot of time learning the ins and outs of a new utility, First Aid 98 may meet your needs. Finally, if you spend a lot of time opening the box or just want to know more about how your system works, you may want to consider one of the two hardware utilities; we recommend PC Care 97 for most users.

TOUCHSTONE SOFTWARE CORP.

CheckIt version 5

All reviews by Barry Simon

In this latest edition, TouchStone Software Corp. has tacked a slick Windows 95 front

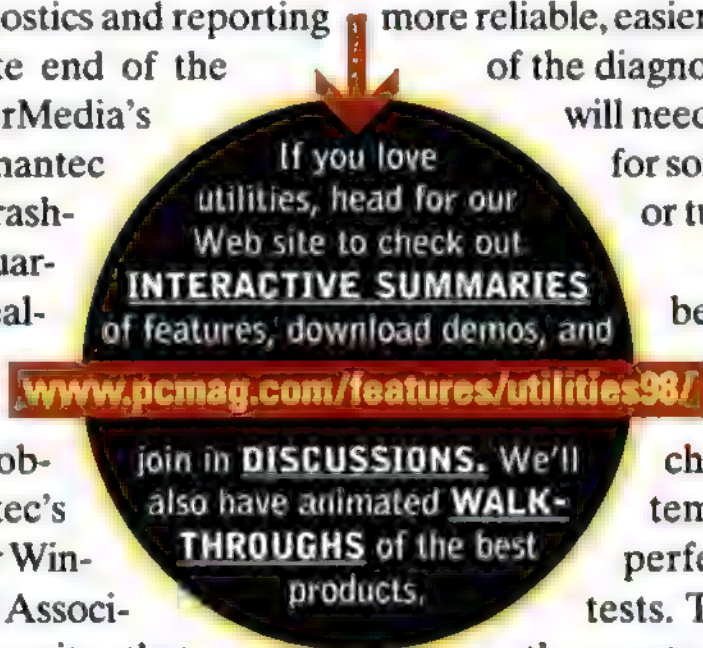
end onto CheckIt version 5 (\$50 street) and bolstered the product's testing component. Although American Megatrends' PC Care 97 offers more hardware tests, CheckIt is more reliable, easier to use, and includes all of the diagnostics that typical users will need. But it is not designed for software troubleshooting or tune-up.

CheckIt has long been notable for its accuracy in reporting on IRQs, DMA channels, and other system resources. It scored perfectly in terms of these tests. The program provides three sets: a quick check of the

motherboard, ports, and drives; a more thorough examination of these components; and a suite of six tests that includes all of the ones listed above, plus modems, memory, and video calibration.

The thorough testing module deserves high marks for its clear explanation of each test's purpose. You can choose to run all the tests and select the number of iterations of a single test. Unlike PC Care 97, CheckIt does not report on SCSI or PC Card information. TouchStone says an update will add these tests.

CheckIt's software-troubleshooting and disaster-recovery features are limited. You can save and restore compressed



backups of your registry and other critical Microsoft Windows 95 files and take snapshots of your hardware, DLLs, and INI files. And you can load a memory-resident application that backs up critical files and runs the quick hardware check at regularly scheduled intervals.

Like PC Care 97, CheckIt no longer includes a module that attempts to find unused files. Instead, by focusing on CheckIt's core strengths of diagnostics and testing, TouchStone delivers an excellent hardware diagnostics utility.

CheckIt version 5. Street price: \$50. Requires: 486-based PC or better, 12MB RAM, 10MB hard disk space, Microsoft Windows 95. TouchStone Software Corp., Huntington Beach, CA; 714-969-7746; fax, 714-969-1555; www.touchstonesoftware.com. Choose 501 at www.pcmag.com/infolink.

CYBERMEDIA INC.

First Aid 98



Novice users who rarely make changes to their systems can probably get away without a troubleshooting utility. Power users, on the other hand, will want a robust solution such as

Network Associates' Nuts & Bolts. But many users fall somewhere between these extremes. And for those intermediate users, CyberMedia's First Aid 98 (\$40 street) is a good solution. First Aid's primary purpose is to resolve software conflicts. It also provides a set of hardware diagnostics and tune-up features in an easy-to-use package.

Like the similar RealHelp from Quarterdeck, First Aid consists of two main components: the memory-resident program Windows Guardian, accessible from a system tray icon, and the main First Aid program. Windows Guardian will warn you if disk space or free resources drop below preset levels. It also includes crash protection, tracks changes to the registry, and monitors applications in the background. If a DLL is missing, for example, it offers to locate the file. If it cannot, it will search the program CD.

The well-designed interface displays an image of a typical desktop computer system; to test a specific component, such as the printer, you simply click on the appropriate image. Or you can perform a check of all components. The tests offered cover

Why You Need a TROUBLESHOOTER

FIX SOFTWARE. Troubleshooting programs can identify problems with applications, such as missing DLLs or invalid registry entries and, in many cases, automatically repair these problems.

DIAGNOSE HARDWARE PROBLEMS. A diagnostic utility offers a suite of tests for verifying that your system and peripherals are working properly.

OPTIMIZE SYSTEM PERFORMANCE. Troubleshooting utilities offer enhanced defragmenters, tools to optimize your registry and swap file, and faster application launching.

AVOID COSTLY SYSTEM CRASHES. Many troubleshooting utilities include crash protection modules and can create rescue disks.

KEEP YOUR SYSTEM UP-TO-DATE. Internet-based services scan your system and download and install software updates and drivers.

all the basic hardware components as well as problems with applications and the registry. The modem test includes diagnostic checks of your Internet setup such as dial-up networking.

First Aid's array of memory, video, input/output devices, disks, and printers is more extensive than in RealHelp. But it can't compete with dedicated hardware diagnostic programs such as American Megatrends' PC Care 97 and TouchStone Software's CheckIt version 5.

After it completes a Check-Up, First Aid displays a list of problems grouped by severity. You can click on an Auto Fix button to have all of them taken care of automatically, or you can view a detailed explanation and solution of each problem.

Though First Aid's default settings will meet the needs of most users, the options for changing them can be difficult to find, because they are not located under the Options menu. And whereas the program provides a list of problems and solutions, there is no easy way to obtain a list of tests performed and tests passed by the system.

First Aid has an extensive knowledge base that the program can draw on if Check-Up is unable to come up with a solution. But the only way to access this base is by first going through the Check-Up procedure. And First Aid provides no full-text search. It does include a reference section with a 250-term hypertext glossary, a list of frequently asked questions, and a collection

EDITORS' Choice

- First Aid 98
- Nuts & Bolts

Our two Editor's Choice selections both provide some tools for software troubleshooting, hardware diagnostics and reporting, and system tune-up. But each is intended for a different audience. First

Aid 98 is the easiest to use and is targeted at new users; Nuts & Bolts is a more powerful set of tools that is best suited for power users.

One of First Aid's chief strengths is its interface, which consists of an image of a typical desktop system. To test a specific component or peripheral, you simply click on the appropriate image. Or you can check everything at once. Click on Auto Fix and First Aid takes care of the rest. First Aid also includes a memory-resident applet that monitors system resources; crash protection, a virus scanner, and a

utility for creating emergency disks.

Recently acquired by Network Associates, Nuts & Bolts includes features too numerous to list. Its core features—troubleshooting, tune-up,

and hardware diagnostics—closely mirror those of Symantec Corp.'s Norton Utilities 3.0 for Windows 95. Also, Nuts & Bolts offers an EZ Setup module for tweaking Windows, secure erase for files, encryption, file compression, and a floating toolbar from which you can launch applications. In short, it is the most comprehensive troubleshooting utility currently available.



of "How Do I..." videos on CD-ROM.

In First Aid's emergency section, you'll find a virus scanner, a utility for creating emergency disks, Windows ScanDisk, Disk Defragmenter, and backup tools. From this module, you can also make changes to the

registry that the Windows Guardian has been tracking. First Aid licenses its virus scanner from Trend Micro (see "Protect Your Files" in this issue for details), and the program includes a trial version of Oil Change. First Aid Deluxe (\$60 street) adds a cleaning kit and a full version of Trend Micro's antivirus package. The only drawback to First Aid is that it offers users little flexibility. But most will find it to be just what the doctor ordered.

First Aid 98. Street price: \$40. Requires: 486-based PC or better, 8MB RAM, 65MB hard disk space, Microsoft Windows 95. CyberMedia Inc., Santa Monica, CA; 800-721-7824, 310-664-5000; www.cybermedia.com. Choose 502 at www.pcmag.com/infolink.

SYMANTEC CORP.

Norton CrashGuard Deluxe

In a perfect world, Microsoft Windows would never crash. But in the real world, crash protection is so important that it is an integral part of First Aid 98, Norton Utilities 3.0 for Windows 95, Nuts & Bolts, and RealHelp Extra Strength. Symantec also offers a standalone crash-protection



IT DOESN'T GET ANY EASIER than First Aid 98's interface. To test a component, just click on the corresponding icon. You can test all components at once and automatically fix problems.

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THE 1998 UTILITY GUIDE

Troubleshooting Utilities

utility, Norton CrashGuard Deluxe (\$50 street). But for the \$30 difference in price between this unit and Norton Utilities 3.0 (\$80 street), we recommend you purchase the more comprehensive package.

When a problem occurs, a crash protection utility lets you save the files you were working on, exit, and reboot safely without losing your work. The crash protection offered in CrashGuard Deluxe is identical to that of CrashGuard in Norton Utilities. CrashGuard Deluxe also includes the ability to scan for viruses, check hard disk integrity, and identify invalid registry entries, missing DLLs, and orphaned shortcuts and attempt to correct them.

A memory-resident AutoCheck module warns you of low resources or disk space, and CrashGuard Deluxe includes a basic disk defragmenter. You also get a six-month subscription to Norton Live-

Update Pro, a video library on optimizing your system, and a computer glossary.

Norton CrashGuard Deluxe. Street price: \$50. Requires: 486-based PC or better, 12MB RAM, 15MB hard disk space, Microsoft Windows 95. Symantec Corp., Cupertino, CA; 800-441-7234, 541-334-6054; www.symantec.com. Choose 503 at www.pcmag.com/infolink.

SYMANTEC CORP.

Norton Utilities 3.0 for Windows 95

For 15 years, Norton Utilities has been synonymous with the idea of extending the operating system to gain an extra degree of safety and security. Norton Utilities 3.0 for Windows 95 (\$80 street) continues in that tradition. This year, however, Norton Utilities has met its match in Network Associates' Nuts & Bolts.

The most visible component of Norton Utilities is System Doctor, which sits on your desktop. It displays real-time gauges that measure system resources such as disk optimization and CPU utilization. Disks and files have long been a Norton specialty, and this still rings true. Norton Disk Doctor is more thorough than Windows' ScanDisk at checking disk integrity. Norton even includes a DOS version that replaces the DOS version of ScanDisk.

Norton Utilities has a range of tools to keep you out of trouble: Image saves copies of critical areas on your hard disk, and Norton Protection saves some deleted files that aren't normally saved in the Recycle Bin, such as files deleted during DOS sessions. CrashGuard keeps you up and running long enough to save your work.

One of Norton Utilities' best features is WinDoctor. Designed to root out soft-

SUMMARY OF FEATURES

See www.pcmag.com for interactive views

Troubleshooting Utilities

	CheckIt version 5	PC MAGAZINE EDITOR'S CHOICE First Aid 98	Norton CrashGuard Deluxe	Norton Utilities 3.0 for Windows 95	PC MAGAZINE EDITOR'S CHOICE Nuts & Bolts	PC Care 97	RealHelp Extra Strength
■ YES ■ NO							
Street price	\$50	\$40	\$50	\$80	\$50	\$50	\$60
Reporting							
Lists free IRQs	■	■	■	■	■	■	■
Lists free DMAs	■	■	■	■	■	■	■
Reports SCSI IDs	■	■	■	■	■	■	■
Reports PCI-bus usage	■	■	■	■	■	■	■
Diagnostics							
Tests memory	■	■	■	■	■	■	■
Tests modems	■	■	■	■	■	■	■
Enhanced ScanDisk	■	■	■	■	■	■	■
Antivirus scanner	■	■	■	■	■	■	■
Tune-Up							
Defragments disk	■	■	■	■	■	■	■
Locates and repairs orphaned shortcuts	■	■	■	■	■	■	■
Locates and repairs orphaned registry entries	■	■	■	■	■	■	■
Visual gauges show free disk space	■	■	■	■	■	■	■
Can free up disk space	■	■	■	■	■	■	■
Troubleshooting							
Crash protection	■	■	■	■	■	■	■
DOS-mode ScanDisk during boot-up	■	■	■	■	■	■	■
Rescue disk	■	■	■	■	■	■	■
Windows rescue disk on Iomega Zip or Jaz Drive	■	■	■	■	■	■	■
Enhanced Recycle Bin	■	■	■	■	■	■	■
Disk image	■	■	■	■	■	■	■
Tracks registry changes	■	■	■	■	■	■	■
Can compress registry	■	■	■	■	■	■	■
Other Features							
Registry editor	■	■	■	■	■	■	■
Program launch accelerator	■	■	■	■	■	■	■
File compression manager	■	■	■	■	■	■	■
File comparison utility	■	■	■	■	■	■	■
Updates program over the Internet	■	■	■	■	■	■	■

* The Professional version includes an antivirus scanner.

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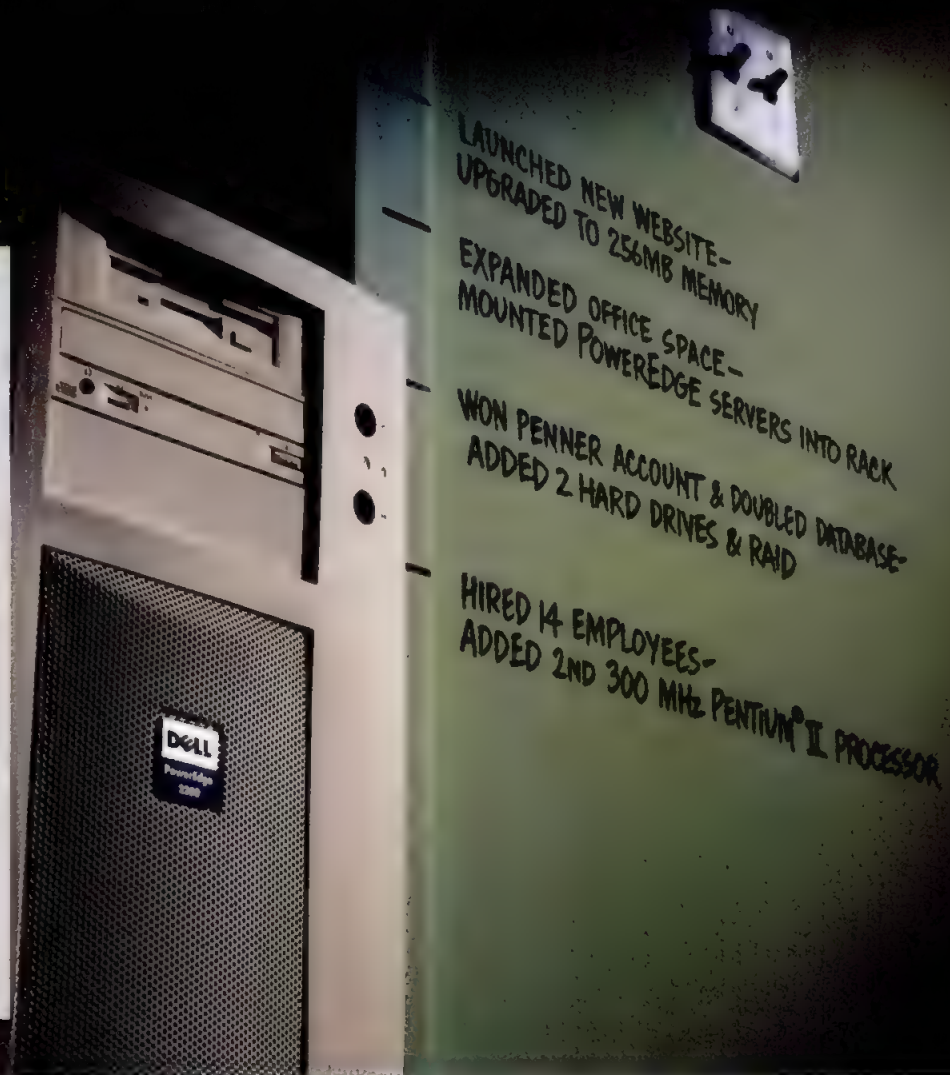
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Troubleshooting Utilities

ware-related problems such as shortcuts or registry entries that are missing their files, WinDoctor is thorough and well designed. It is not, however, without problems: Too often it recommended that we delete an offending registry key or directly edit the registry (it won't search

Windows. If you have an Iomega Zip or Jaz Drive, you can make a ZIP Rescue Disk that can boot directly to Windows.

Norton Utilities has several tools to optimize performance. Optimization Wizard and WinDoctor streamline your registry; Wizard also sets swap-file parameters

to improve performance. The Speed Disk disk defragmenter has been enhanced, and a memory-resident program called Speed Start hastens the launching of applications.

But Norton Utilities has some weaknesses.

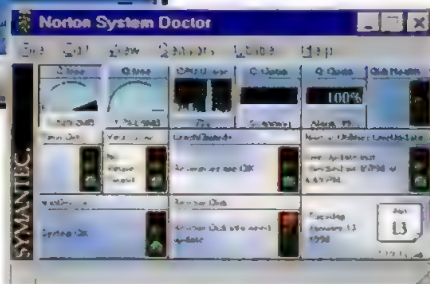


ALL OF NORTON UTILITIES' tools are neatly integrated in a single window.

for the missing file, as CyberMedia's First Aid 98 will), and, on our tests, it had trouble locating a DLL in a shared directory.

If you must delve into the registry, Norton's Registry Editor is a big improvement over Windows' REGEDIT.EXE. It lets you bookmark keys, and when you perform a search of the entire registry, it gives you a list of all the relevant hits—something Windows doesn't do. Norton Utilities also includes a Registry Tracker.

Norton's emergency Rescue Disk is also an improvement over what comes with



Symantec has acknowledged several problems, including conflicts with AOL, McAfee VirusScan, and Diamond Multimedia video cards and drivers. The company has released patches for some but not all of these problems.

Norton Utilities is also not very adept at hardware diagnostics: On our tests, it missed several IRQs, and it provides no

DMA information. For these tasks, we recommend a dedicated hardware utility such as TouchStone's CheckIt version 5 or American Megatrends' PC Care 97.

We also found Norton Utilities to be heavy-handed at times. For example, since it places its memory-resident applications in the Registry Run keys rather than in the Windows Startup group, you have less control over them.

Norton Utilities is still a formidable package, but between the two heavyweights, Nuts & Bolts has won this round. **Norton Utilities 3.0 for Windows 95.** Street price: \$80. Requires: 486-based PC or better, 8MB RAM, 45MB hard disk space, Microsoft Windows 95. Symantec Corp., Cupertino, CA; 800-441-7234; 541-334-6054; www.symantec.com. Choose 513 at www.pcmag.com/infolink.

NETWORK ASSOCIATES INC.

Nuts & Bolts



Taking on an institution is a difficult challenge, but Nuts & Bolts (\$50 street) is up to the task. It matches Symantec's Norton Utilities 3.0 for Windows 95 feature for feature and adds extra capabilities for good measure. Like Norton Utilities, Nuts & Bolts exhibited some flaws on our tests. Even so, it is the best package available for troubleshooting and system tune-up.

As we were completing our story, Network Associates (the result of a merger

SUITABILITY TO TASK



	CheckIt version 5	First Aid 98	Norton CrashGuard Deluxe	Norton Utilities 3.0 for Windows 95	Nuts & Bolts	PC Care 97	RealHelp Extra Strength
Reporting	Good	N/A	N/A	Fair	Fair	Poor	Fair
Diagnostics	Good	Fair	N/A	Fair	Fair	Excellent	Fair
Tune-up and cleanup	N/A	Good	Fair	Excellent	Excellent	N/A	Good
Software troubleshooting	N/A	Excellent	Good	Good	Good	N/A	Good

N/A—Not applicable: The product does not have this feature.

The seven packages we reviewed are designed to address a wide range of PC problems. No one product meets all troubleshooting needs—from resolving software conflicts to eking the most performance out of your PC to reporting on hardware. To cover all the bases, you'll need more than one troubleshooting utility. If, however, you have a particular chore in mind, our Suitability to Task ratings can help target the best product for the job.

For **reporting** we evaluate the program's ability to provide the user information on IRQs, DMAs, and I/O ports. Extra features in this category include performance testing and the ability to report on other areas such as the PCI and SCSI buses, as well as feedback on Windows and data structures.

The core of most troubleshooting utilities, **diagnostics** reflects the program's ability to identify problems with the system's CD-ROM drive, hard disks, keyboard, mouse, memory, sound, and video.

Windows leaves lots of files in its wake. **Tune-up and cleanup** involves the program's ability to weed out unnecessary files such as old shortcuts and DLLs, orphaned registry entries, and duplicate files. Tools for optimizing system performance are also critical here.

Finally, for **software troubleshooting** we evaluate the package's ability to guard against system crashes, locate missing DLLs, resolve software conflicts, restore shortcuts and registry entries to applications that have been moved, and rescue the user when a disaster occurs.

Solving PROBLEMS Online

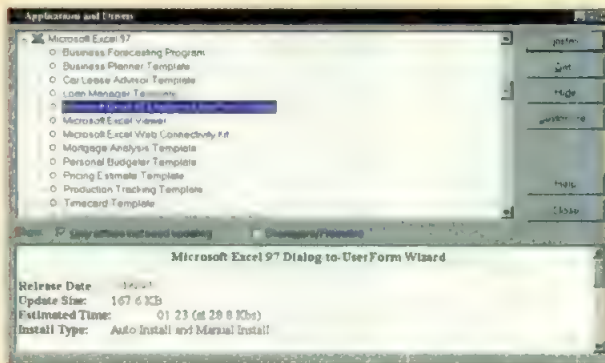


Keep up with the Joneses by using one of the Internet-based services that deliver software updates.

troubleshooting and the Internet: a logical match in an industry where new drivers and software updates emerge at a dizzying pace. Online troubleshooting services analyze the software on your system, inform you when new drivers or patches are available, and automatically download and, in many cases, install them for you.

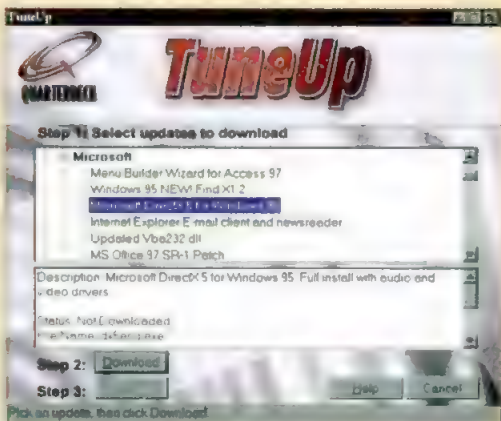
We looked at three services: Symantec Corp.'s Norton LiveUpdate Pro, CyberMedia's Oil Change, and Quarterdeck Corp.'s TuneUp.com.

Limited versions of these products are included with CyberMedia's First Aid 98 and both versions of Quarterdeck's RealHelp. Likewise, Symantec's Norton CrashGuard Deluxe and Norton Utilities 3.0 for Windows 95 both include Norton Web Services, which provides a six-month subscription to LiveUpdate Pro. The service is also available separately. Intel Corp. is planning to launch a competitive service called AnswerExpress Support Suite.



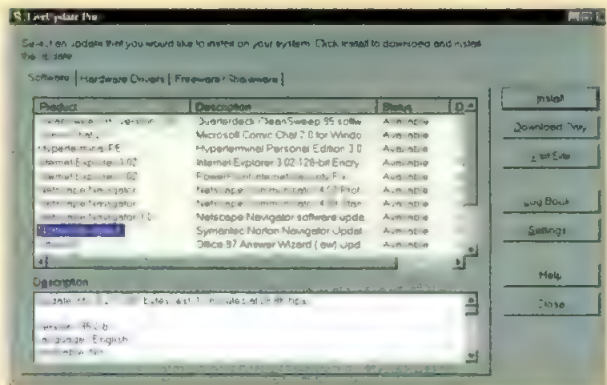
Norton LiveUpdate Pro ►

A standalone version of the LiveUpdate feature found in Symantec's products, Norton LiveUpdate Pro (\$30 a year or \$3.95 a month) has the best design of the three update services. Its tabbed dialog box separates the list of possible downloads into three categories: Software, Hardware Drivers, and Freeware/Shareware. LiveUpdate Pro provides patches for Norton Utilities, new virus definition files for the Editors' Choice-winning Norton AntiVirus, and updates and drivers for other applications. You can undo any update. (800-441-7234, 541-334-6054; www.symantec.com. Choose 584 at www.pcmag.com/infolink.)



◀ Oil Change

A standalone program, CyberMedia's Oil Change (\$40 street with a one-year subscription) includes updates for more than 5,800 applications, and it offered the most updates of all the services for our test system. If you choose to install any of these updates, Oil Change connects you to an FTP or Web server and downloads them to your hard disk. In many cases, it can automatically install the update as well. A Multiple Undo feature allows you to uninstall one or more of the updates. Other features not found in competing services include unattended updates and automatic notification of new updates. (800-721-7824, 310-664-5000; www.cybermedia.com. Choose 585 at www.pcmag.com/infolink.)



◀ **TuneUp.com**

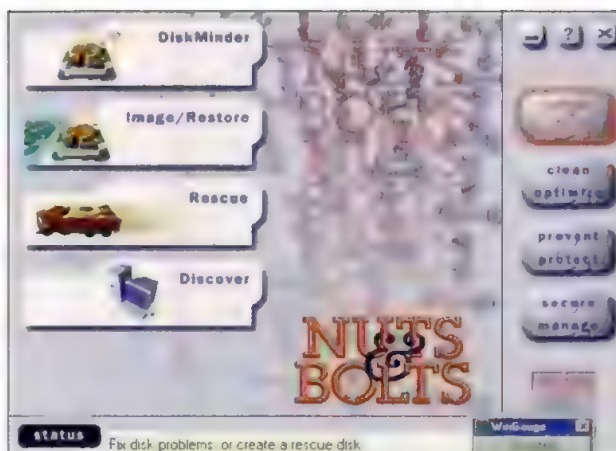
Quarterdeck Corp. claims its library of updates for TuneUp.com (\$40 street for TuneUp, with a one-year subscription or \$4.95 a month) covers more than 3,000 products, but on our tests it offered fewer update files for major applications than Oil Change did. A Rollback feature allows you to uninstall a patch installed by TuneUp.com. Quarterdeck's service also includes the TuneUp AV antivirus service and one year of free virus-definition file updates. TuneUp.com is also an excellent technical-support resource. It includes a list of frequently asked questions and tips, bug alerts, discussion forums, and a directory of more than 2,900 tech-support phone numbers and links to Web sites. (800-683-6696, 573-443-3282; www.quarterdeck.com. Choose 586 at www.pcmag.com/infolink.) — Barry Simon

between McAfee and Network General) announced plans to purchase Helix Software, the developer of Nuts & Bolts. The program includes everything you'd expect in a complete troubleshooting and performance-enhancement package. Its answer to the Norton System Doctor is WinGauge, a desktop utility that lets you graphically monitor free disk space and other system resources. Nuts & Bolts has an enhanced disk integrity checker and disk defragmenter. And it can store images of your basic disk areas such as the FAT (file allocation table) and produce a rescue disk.

Like Norton Utilities, it has a crash-protection module that handles both system crashes and freezes. Its improved Recycling Bin catches deletions such as those by DOS programs.

One feature with which Nuts & Bolts stands out is its EZ-Setup module. It lets you customize aspects of Windows behavior such as what items appear when you right-click on a file type in Explorer.

Via EZ-Setup or the StartUp group, Nuts & Bolts lets you control which of its resident modules load when Windows



NUTS & BOLTS' features closely match those of Norton Utilities.

starts up. By contrast, Norton Utilities hides memory-resident programs in the Registry Run key, making it difficult to disable them.

The Discover module offers more thorough hardware diagnostics than those in Norton Utilities, but not as thorough as those found in TouchStone's CheckIt or American Megatrends' PC Care 97. Discover's reporting is extensive; however, it

misreported information on our complex text system, telling us we had no free IRQs or DMA channels—an error that the vendor says occurs only on systems running the OSR2 version of Windows 95.

Nuts & Bolts has a module that searches for orphaned registry entries, but on our tests it incorrectly recommended that we delete entries to program files that did not have an .EXE extension, even though these applications were working fine. For most users, this won't be a problem.

In this module, selecting the Advanced button automatically launches Registry Editor. Like the one in Norton Utilities, Nuts & Bolts' Registry Editor can search for all occurrences of a string and display the results of all hits so that you can jump between occurrences. But it lacks Norton Utilities' handy bookmark feature. Nuts & Bolts' Registry Wizard can compress your registry.

Some unique features of Nuts & Bolts include Shredder (for erasing files securely), ZIP Manager, and a Stronghold encryption module to create password-protected, self-decrypting executables. LaunchPad lets you add applications to a floating palette of program buttons.

Nuts & Bolts has gained the edge over Norton Utilities this year. It deserves a place in your computing toolbox.

Nuts & Bolts. Street price: \$50. Requires: 486-based PC or better, 8MB RAM, 15MB hard disk space, Microsoft Windows 95. Network Associates Inc., Santa Clara, CA; 800-338-8754, 408-988-3832; www.nai.com. Choose 504 at www.pcmag.com/infolink.

AMERICAN MEGATRENDS INC.

PC Care 97

As you would expect from a BIOS maker, American Megatrends Inc. (AMI) thoroughly understands hardware. That expe-

An AIRBAG for Your PC

➔ Built-in crash protection can save you a lot of headaches, but it's not a cure-all.

Five of the products tested for this story (First Aid 98, Norton CrashGuard Deluxe, Norton Utilities 3.0 for Windows 95, Nuts & Bolts, and RealHelp Extra Strength) include crash-protection modules. The purpose of crash protection is to bail you out when a program crashes or simply freezes. When such problems occur, you should be able to save your work, shut down properly, and restart the system.

To test this feature, we simulated seven direct system crashes (three 16-bit tests and four 32-bit tests) by writing to memory owned by a program or by the system. We also caused a Visual Basic program to attempt to exit with a runtime error and to hang with an infinite loop.

The results were fairly consistent. All four crash-protection modules (the crash-protection modules in CrashGuard Deluxe and Norton Utilities are identical) were

able to rescue the Visual Basic program from an infinite loop but failed to trap the Visual Basic runtime error. In addition, all of them trapped the simple 16-bit general protection faults and all but Nuts & Bolts recovered from 32-bit general protection fault and 32-bit write-to-memory tests. Tests that attempted to overwrite Windows' data areas were not successful.

A couple of tips: We strongly advise that you use the Save As command to save your work with a new filename in such instances. Otherwise, you might overwrite a good file with corrupted data. And don't fool yourself into thinking you can simply keep working after a crash occurs; it's best to reboot as soon as possible.

Crash protection won't save you from all crashes. But you'll find that these crash-protection modules are generally an effective way to minimize problems. —Barry Simon

rience shows in PC Care 97 (\$50 street). No other product we tested provides such comprehensive hardware testing nor such detailed reporting. But PC Care still struggled on some of our tests, and its interface definitely needs work.

PC Care has changed little since our roundup a year ago. AMI has dropped the software cleanup, tune-up, and uninstall modules and added some additional tests including SCSI diagnostics, as well as mouse, keyboard, and sound-card checks.

The strongest part of PC Care is its testing module, which covers the processor, system clock, ports, memory, disks, video, keyboard, mouse, sound card, SCSI, PCI bus, and Plug and Play subsystem. You can select any subset of these tests, set parameters, and then save that subset as a script that can be rerun at any time.

The IRQ and DMA reporting module remains error-prone. On our test machine, it reported as free one of two IRQs taken by a sound card, a network IRQ, and an IDE IRQ. It identified only three out of five DMA channels in use. These errors are unacceptable in a product that reports on system resources. However, PC Care does report a lot of information, such as PCI and IDE BIOS status, that is not available in Windows' own Device Manager.

To get at this detailed information, you have to do a lot of clicking. Since you cannot open multiple reporting windows at once, you spend a lot of time opening and closing windows to jump between sections of the reporting module. Overall, PC Care's interface could use some fine tuning.

AMI's primary competitor, TouchStone Software Corp., has closed the gap this year by improving CheckIt's testing and redesigning its interface. Unless you need PC Care's batch mode or advanced tests such as SCSI and PCI bus, you'll find CheckIt to be a better choice.

PC Care 97. Street price: \$50. Requires: 486-based PC or better, 8MB RAM, 10MB hard disk space, Microsoft Windows 95. American Megatrends Inc., Norcross, GA; 800-828-9264, 770-246-8600; www.ami.com. Choose 505 at www.pcmag.com/infolink.

QUARTERDECK CORP.

RealHelp Extra Strength

A new product, Quarterdeck's RealHelp Extra Strength is designed to compete

directly with CyberMedia's First Aid 98, and its well-rounded toolset compares favorably. However, we found RealHelp's diagnostics to be uneven and even misleading at times, and its interface can be distracting. First Aid offers similar features, fewer glitches, and a better interface.

RealHelp borrows technology from two older Quarterdeck products, Fix-It and WINProbe, but more closely resembles Fix-It. (Quarterdeck has phased out WINProbe; Fix-It's future is uncertain.) RealHelp comes as Regular Strength (\$40 street) and Extra Strength (\$60 street); the latter includes a one-year subscription to Quarterdeck's TuneUp.com service and a Microsoft Office 95 knowledge base.

RealHelp consists of two parts: the



THE CORE OF REALHELP EXTRA STRENGTH'S prevention modules is its troubleshooting features.

memory-resident Service Manager and the main RealHelp application. Service Manager tracks system resources and alerts you to problems by changing colors (green, yellow, and red), displaying a pop-up message, or playing an audio file. It includes Crash Defender for crash protection.

Some of the agents associated with Service Manager simply schedule built-in Windows 95 utilities such as Backup, ScanDisk, and the disk defragmenter. Another agent schedules RealHelp's antivirus module, a scanner and repair program licensed from EliaShim (the makers of ViruSafe). RealHelp does not include memory-resident virus protection. Finally, an agent called Change Capture tracks changes in the registry.

The main program has Full System Check, an option that runs RealHelp's hardware diagnostics and some of the software checks. Hardware diagnostics cover

drives, input devices, memory, modems, motherboard, printer, processor, sound, system clock, and video. These are more comprehensive than those of CyberMedia's First Aid 98 but less than hardware-centric products such as TouchStone Software's CheckIt and AMI's PC Care 97.

RealHelp has extensive tools for coping with software headaches. It searches for invalid pathnames in shortcuts and in the registry and attempts to locate the correct path. Its Conflict Detector searches for missing DLLs and other components. You can even search for potential conflicts between the programs already installed and a program you're thinking of adding.

Some of the information in the knowledge base used by Conflict Detector is out of date. For example, RealHelp reported incorrectly that the information manager ECCO Pro was not installed because it failed to recognize the newer executable file Ecco32.exe.

Although RealHelp's lists of potential application conflicts can be helpful, the way the program notifies you of possible problems even when you clearly do not need assistance can be puzzling. For example, RealHelp explains what to

do if an installation of Adobe Acrobat fails, even if the document reader is already properly installed on your system.

The RealHelp interface includes some gimmicks such as sliding menus and sound effects that we found get old fast. You can disable the sounds under the Options menu. If RealHelp can't solve your problem, it can help you find someone who can: It includes a directory of technical-support information for about 2,000 vendors.

RealHelp has all the key ingredients. But when you put them all together, the product falls short.

RealHelp Extra Strength. Street price: \$60; (Regular Strength, \$40). Requires: 486-based PC or better, 8MB RAM, 30MB hard disk space, Microsoft Windows 95. Quarterdeck Corp., Marina del Rey, CA; 800-683-6696; 573-443-3282; www.quarterdeck.com. Choose 506 at www.pcmag.com/infolink. **PC**



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UNINSTALLERS

CLEAN UP your hard disk

Too many downloads? One of these uninstaller utilities will safely rid your system of unwanted files and old applications. By Edward Mendelson

Megabytes of junk files on your hard disk waste space, slow down your system, and conflict with software. The solution to this overcrowded mess is an uninstaller. The six products we review here attempt to clean up your system more thoroughly and safely than Windows 95's Add/Remove Programs applet; a few do so rather well.

Typically, when you put an uninstaller

on your system, it first scans your disk to create a complete database of your files, including an important catalog of links and dependencies that tells it which dynamic link libraries (DLLs) and other files are required to run specific applications—a feature not found in Add/Remove Programs. Every time you run the uninstaller, it updates the database. Then it's ready to perform three basic tasks: remove unwanted applications, archive or transfer applications, and clean out miscellaneous unused or seldom-used files.

When you install an application, uninstallers use a background-monitoring program to record the names of files added or changed, and any data added or modified in the registry and INI files. When you want to remove or archive an application, an uninstaller deletes or modifies only those files that were added or changed.

Not all uninstallers are thorough, but the best carefully weed out all unwanted files, leaving you with a cleaner, faster system.

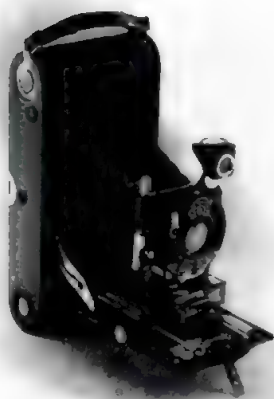
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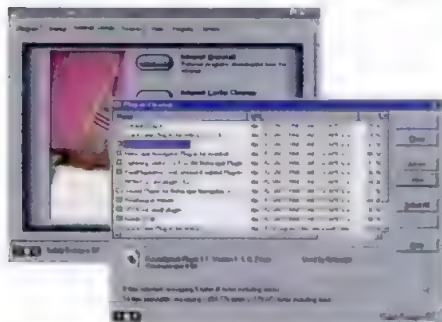
CleanSweep Deluxe

All reviews by Edward Mendelson



No uninstaller is perfect, but CleanSweep Deluxe comes close. Quarterdeck's package (\$60 street) goes beyond standard application removal and file cleanup by adding Internet-related features that remove browser plug-ins, cookies, browser cache files, downloaded ActiveX controls, and the associated registry keys. Its background installation monitor starts up automatically and monitors files and registry keys added by setup programs or downloaded and installed by Microsoft Internet Explorer. And it's smart enough to continue monitoring changes after a setup program restarts Windows.

CleanSweep builds a database of file links when you first run it, then quickly updates the database each time you run it again. A tabbed interface gives fast access to menus from which you can remove or archive applications and other files. Wizards guide you during the



CLEANSWEEP'S UNIQUE InternetSweep feature cleans out plug-ins and other Internet leftovers.

removal of applications. You can review the list of files and registry keys recommended for removal, view the contents of all the files on the list, and overrule the recommendations.

CleanSweep's safety features strike a good balance between caution and thoroughness. The program won't let you remove files it considers essential to your system. By default, CleanSweep backs up everything it removes except temporary files. It is fast and powerful enough for experienced users but simple enough for beginners.

CleanSweep Deluxe. Street price: \$60. Requires: 486-based PC or better, 8MB to 16MB RAM, 11MB to 13MB hard disk

EDITORS' Choice**→ CleanSweep Deluxe**

Fast, easy to use, effective, and safe, CleanSweep Deluxe stands above the rest of the uninstallers. While some of the others we tested shared one or more of CleanSweep's characteristics, none offered the

combination of performance and safety that earned CleanSweep our Editors' Choice.

Not only was CleanSweep's own installation quick, but the time it took to monitor installations was among the fastest on our tests. And with clear wizards and a tabbed interface that gives you access to menus for removing or archiving applications, CleanSweep is both effective and easy to use. In addition to applications, CleanSweep can remove browser plug-ins, cookie files, browser cache files, and downloaded ActiveX con-

trols—as well as the registry keys associated with them.

Last, and perhaps most important, CleanSweep strikes the right balance between safety and strength. CleanSweep's red lights prevent you from removing critical system files, and the yellow light warns you if there's a chance that removing a file could cause problems. What's more, you can always review the list of files and registry keys that CleanSweep intends to remove. No other uninstaller does Windows as well as CleanSweep.



space, Microsoft Windows 95 or NT 4.0. Quarterdeck Corp., Marina del Rey, CA; 800-683-6696, 573-443-3282; www.quarterdeck.com. Choose 506 at www.pcmag.com/infolink.

SYMANTEC CORP.

Norton Uninstall Deluxe

Though not the fastest, Norton Uninstall Deluxe (\$40 street) features an InstallGuard option that backs up every file modified by an installation—a feature that you won't find in other uninstallers. The product lacks a few features, however, and its performance was subpar on our tests.

Norton Uninstall monitors installations even after the installer restarts Windows. It also creates self-installing archives of programs that you can transfer to other systems. You can remove an application with a few mouse clicks and review the list of files and registry keys recommended for removal. Unlike CleanSweep Deluxe, Norton Uninstall doesn't color-code files to

indicate safety levels, but we found its file-removal list to be safely conservative.

Norton Uninstall lacks an option to remove orphaned DLLs. Its modules for removing duplicate files and detached items in the registry are generally safe, but you have to right-click on individual filenames to determine which of two matching files has a higher version number.

On heavily loaded test systems, Norton Uninstall Deluxe was too slow. This first release of the program also crashed occasionally when we used the keyboard instead of the mouse for navigating dialog boxes. Symantec promises a fix by the time you read this. Norton Uninstall Deluxe is a comprehensive and safe utility, but poor performance prevents it from rising to the top of this class.

Norton Uninstall Deluxe. Street price: \$40. Requires: 486-based PC or better, 8MB to 16MB RAM, 10MB hard disk space, Microsoft Windows 95 or NT 4.0. Symantec Corp., Cupertino, CA; 800-441-7234, 541-334-6054; fax, 541-334-7474;



Uninstallers

www.symantec.com. Choose 503 at www.pcmag.com/infolink.

ALPHA SOFTWARE CORP.

PowerCleaner

Priced at \$30 (street), PowerCleaner seems like a bargain. But buyer beware: Alpha Software's uninstaller could not complete many basic tasks on some of our test systems, and when it did complete a task, its operation was painfully slow.

If you let it, PowerCleaner can remove files other programs won't touch. This can be a double-edged sword, especially since PowerCleaner lacks essential safety features such as the ability to undo its own uninstalls. Its interface is so confusing that you may not always understand what it is doing to your system.

PowerCleaner actually recommends that you use Windows 95's built-in applet Add/Remove Programs to remove software. If you decide to use PowerCleaner's removal module, you can't back up all the files and registry entries for the removed application. PowerCleaner won't let you run other programs while it builds its links database, and the process is so slow that users will need the option that builds the database overnight. On our toughest tests, it simply quit before it could finish building the database. Alpha Software acknowledged this problem.

PowerCleaner includes a duplicate file finder and a basic .INI file editor. The cleanup module is a set of shortcuts to existing Windows tools.

Alpha Software promises an improved version of PowerCleaner later this year.

Why You Need an UNINSTALLER

REMOVE APPLICATIONS. An uninstaller monitors changes to your system so that programs can be removed safely and thoroughly.

CLEAN UP YOUR SYSTEM. Uninstallers can locate and remove files that you no longer need, such as duplicate files, orphans, redundant DLLs, or infrequently used files.

TIDY UP AFTER BROWSING. Uninstallers now attack the files that get left behind when you browse the Web.

ARCHIVE APPLICATIONS. If you do not use an application frequently, you can archive it to save disk space. You can even create self-installing archives to transfer an application to another volume or system.

In the meantime, you should avoid it.

PowerCleaner. Street price: \$30. Requires: 486-based PC or better, 8MB RAM, 12MB hard disk space, Microsoft Windows 95. Alpha Software Corp., Burlington, MA; 800-451-1018, 617-229-2924; www.alphasoftware.com. Choose 507 at www.pcmag.com/infolink.

QUARTERDECK CORP.

Remove-It

When you first see Remove-It's animated icons in your taskbar, you may think that this uninstaller (\$30 street) from Quarterdeck is more of a toy than a utility. Unlike CleanSweep, Quarterdeck's more powerful uninstaller, Remove-It is intended for the novice user. It lacks some features found in CleanSweep but is relatively full-featured. But it has some

glitches you won't find in CleanSweep.

Remove-It builds a database of file links when you run it the first time. When you reopen Remove-It, it updates the database quickly, and a background installation monitor records files and registry keys added by new applications. When removing a program, you can choose between an Express option and a Custom option that lets you decide which files and keys to remove or retain. With some programs, Remove-It forces you to delete or retain all the program's registry keys instead of picking and choosing individual keys.

A clean-up wizard walks you through the removal of unneeded and duplicate files, but unlike CleanSweep, Remove-It won't stop you from removing potentially important files. In addition, you can't see the version numbers of two copies of the same file at the same time. Finally, Remove-It's backup feature won't work if your System.dat file is too large to fit on a single floppy disk.

Last upgraded in March 1996, Remove-It is due for an update. It's an effective program, but better uninstallers exist.

Remove-It. Street price: \$30. Requires: 386-based PC or better, 4MB RAM, 3MB to 4MB hard disk space, Microsoft Windows 3.x or later. Quarterdeck Corp., Marina del Rey, CA; 800-683-6696, 573-443-3282; www.quarterdeck.com. Choose 506 at www.pcmag.com/infolink.

CYBERMEDIA INC.

UnInstaller 4.5

The former leader in this category, UnInstaller 4.5 (\$40 street) has lost some of

SUMMARY OF FEATURES

See www.pcmag.com for interactive views

Uninstallers



	CleanSweep Deluxe	Norton Uninstall Deluxe	PowerCleaner	Remove-It	UnInstaller 4.5	WinDelete 97
■ YES ■ NO						
Street price	\$60	\$40	\$30	\$30	\$40	\$30
Background installation tracking	■	■	■	■	■	■
Installation tracking on command	■	■	■	■	■	■
Backs up when removing files	■	■	■	■	■	■
Moves applications between drives	■	■	■	■	■	■
Moves applications between PCs	■	■	■	■	■	■
Creates self-installing files	■	■	■	■	■	■
Finds duplicate files	■	■	■	■	■	■
Fully edits .INI files	■	■	■	■	■	■
Prompts to remove backup files	■	■	■	■	■	■
Removes invalid Registry items	■	■	■	■	■	■
Removes browser-related files	■	■	■	■	■	■

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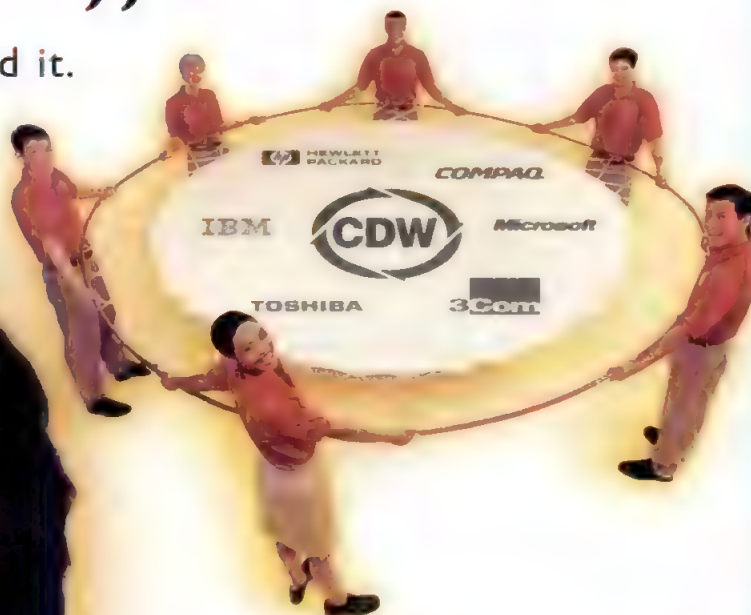
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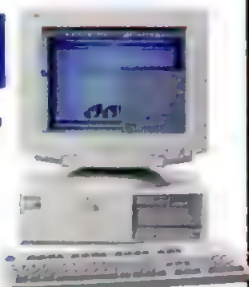
266MHz INTEL PENTIUM® II



HP Vectra VL Pentium II PC

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Performance Tests: UNINSTALLERS

➔ An uninstaller is designed to safely remove programs. So it must keep close tabs on the changes to your files—a time-consuming process. The better the performance, the more likely you will be to use an uninstaller faithfully.

WHAT THE NUMBERS MEAN

Four of the six programs we tested take before-and-after snapshots, or "scans," of your entire hard disk. Although this approach is effective, it can be very time-consuming. The average scan time following an installation for these four products (Norton Uninstall Deluxe, PowerCleaner, Remove-It, and UnInstaller 4.5) was 2.5 minutes.

CleanSweep and WinDelete have devised a more efficient approach. During the installation of any program, CleanSweep and WinDelete log every file and registry entry added, deleted, or modified. WinDelete appears to be the fastest during the installation process but postpones some of its scanning until you

actually uninstall the application. CleanSweep was close behind.

HOW WE TESTED

To gauge the performance of uninstallers, we tested how it long took each program to scan the local drive prior to installing an application and how long it took to scan the local drive after installation. We used three applications of varying sizes: Starfish Software's Sidekick 97 (12MB), Caere's Omni-

Page Pro 8.0 (30MB), and Corel Lumiere (120MB). All tests were performed three times using a Micron Millennia 200-MHz Pentium PC with 32MB RAM and a 2GB hard disk.

Processing Time During Installation

Seconds	Average processing time before installation	Average processing time after installation		
		Sidekick 97 (12MB)	OmniPage Pro 8.0 (30MB)	Corel Lumiere (120MB)
CleanSweep Deluxe	2.7	3.8	5.7	5.5
Norton Uninstall Deluxe	16.4	31.3	43.9	363.6
PowerCleaner	65.1	125.0	124.3	124.5
Remove-It	9.9	10.3	13.2	17.7
UnInstaller 4.5	47.7	46.3	66.6	63.7
WinDelete 97	<1.0	<1.0	<1.0	<1.0

its luster. Though this easy-to-use version boasts a sleek new interface, it won't clean your disk as thoroughly or quickly as CleanSweep Deluxe will.

UnInstaller's four modules offer application removal or archiving, file cleanup, a disk cleanup module that tries to find enough discardable files to give you the free space you need, and restoration of removed files from compressed backups. The application removal and disk cleanup modules are wizard-based.

The file cleanup module presents a list of discardable files, from which you can select the ones you want to remove. UnInstaller cleans out an impressive range of file types ranging from images in your browser cache to miscellaneous text files. A tabbed interface found only in this module lets you switch between screens that

provide details on files that can be deleted.

Throughout the program, files are color-coded to reflect different safety levels. An option lets you select even recoded files that the program regards as risky to remove, but UnInstaller won't let you select essential Windows files.

On our tests, UnInstaller built and updated its database of file links very slowly; only Alpha Software's PowerCleaner was slower. Its relatively slow performance detracts from an otherwise powerful package.

UnInstaller 4.5. Street price: \$40. Requires: 486-based PC or better, 8MB to 16MB RAM, 8MB hard disk space, Microsoft Windows 95 or NT 4.0. CyberMedia Inc., Santa Monica, CA; 800-721-7824, 310-664-5000; fax, 310-664-4720; www.cybermedia.com. Choose 502 at www.pcmag.com.

IMSI CORP.

WinDelete 97

Reading WinDelete 97's list of features, you'd think it's one of the most complete uninstallers on the market. When you actually use the program, however, IMSI's \$30 (street) package seems more like a good idea that needs a lot more work.

WinDelete monitors installations and removes applications, edits .INI files, archives and transfers applications, and cleans out orphaned files, browser caches,

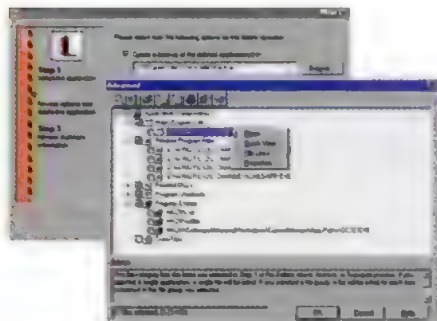
downloaded directories, plug-ins, and ActiveX controls. Unfortunately it failed to complete crucial tasks on our tests.

Unlike other uninstallers, WinDelete doesn't check your disk for file links when you first install it; rather, it makes a fast check of your disk every time you run it. An installation monitor automatically records changes made by setup programs, but on our tests it sometimes popped up and offered to monitor programs that were not setup programs. When you want to remove an application, WinDelete offers a list of removable files but does not advise which you can remove safely and which to keep.

If you uninstall a program that WinDelete didn't monitor, prepare for a long wait while WinDelete analyzes the links. During testing, we found that files listed for removal often included essential files. Worse, WinDelete failed to undo its own uninstallations.

IMSI has acknowledged WinDelete's serious flaws. Until they are addressed, you should look elsewhere.

WinDelete 97. Street price: \$30. Requires: 486-based PC or better, 8MB RAM, 5MB hard disk space, Microsoft Windows 95 or NT 4.0. IMSI Corp., San Rafael, CA; 800-833-8082, 415-257-3000; www.imsisoft.com. Choose 508 at www.pcmag.com/infolink. 



IN UNINSTALLER'S application cleanup module, you can right-click on a file to get details.



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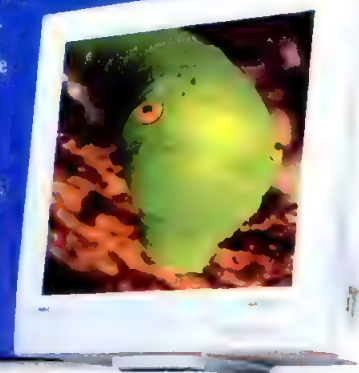
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Weight	11.0 lbs.	11.5 lbs.	22.0 lbs.
Dimensions (w x h x d)	14.1" x 14.2" x 6.6"	14.1" x 14.3" x 6.7"	19.7" x 19" x 8.7"
Brightness	200 cd/m²	180 cd/m²	150 cd/m
160° XtraView Technology	no	yes	yes

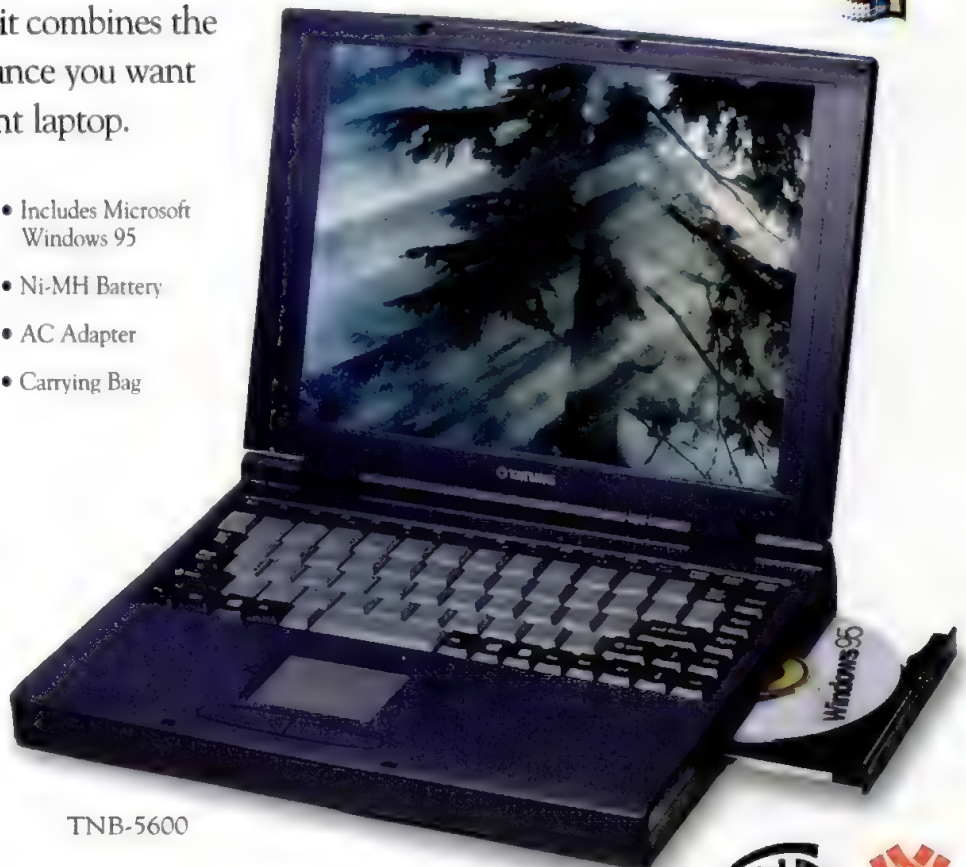


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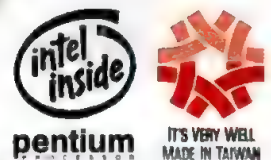
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PERSONAL BACKUP UTILITIES

BACK UP your work

There's no excuse for not protecting your valuable data. These utilities make backing up your work as easy as 1, 2, 3. By M. David Stone

As hard disk capacity continues to grow, so does the importance of personal backup. Even if you don't consider your data to be critical, losing a disk that's not backed up could easily cause hours, if not days, of reinstalling programs and restoring settings to the way you like them. The good news is that you have lots of flexible, easy-to-use choices for backup.

Microsoft Windows 95 comes with two choices of its own: XCOPY (see the sidebar "Backing Up with XCOPY") and Microsoft Backup. Either will serve for

some users, but each has drawbacks. Microsoft Backup can restore files only to the same drive and directory they came from, and it doesn't offer disaster recovery to let you rebuild a crashed disk without reinstalling Windows 95 first. XCOPY requires a level of comfort with the DOS command line that not everyone shares.

Other choices are easy to find, as demonstrated by the programs we've gathered here. They include three standard backup programs, two of which offer disaster recovery. Two of the three programs can back up to tape, and all three can back up to hard disks or virtually any removable disk. We tested them by backing up to a 1.5GB SyQuest SyJet.

Also included here are two programs that let you treat a tape device as a disk drive, so you can save files to tape and read files from tape using any program that can normally save to or read from a disk. We tested these with the Exabyte Eagle Nest TR-3, a tape device. Finally, we look at a newcomer that archives only your precious .INI and configuration files. One of these choices should be just what you need on that dark day when the comforting whirl of your hard disk stops.

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Online BACKUP Services

We all know this: Hard disks sometimes self-destruct, machines get stolen, disasters happen. But too many home and small-business PC users don't have the time, the know-how, or the equipment to back up their critical files consistently. With this in mind, several vendors have introduced online data backup and retrieval. The services use a standard Internet connection—usually for just pennies a day.

The four most popular online backup services are @Backup, Atrieva Service, Personal Vault, from Network Associates (formerly McAfee), and SafeGuard Interactive. All of these companies currently work only with Windows-based PCs and use a standard Internet connection to perform data storage and retrieval. In order to use a service, you must install special software on your PC that lets you pick the files and folders you want to store online. The providers recommend that dial-

up customers back up only their data and not their applications. Even with a 33.6- or 56-Kbps connection to the Internet, it would take hours to back up the entire contents of your hard disk.

All of these providers use some form of encryption to protect your data before it is sent across the Internet. In most cases, you provide the password for the data, and the service provider doesn't have access to it. The providers keep your data on a RAID-based server that you can access 24 hours a day. @Backup, Atrieva, and Personal Vault also scan your data for viruses before storage.

If you back up your data regularly, then the services are not for you. But if you travel frequently and want the ability to retrieve a lost file from any location at any time, the monthly fee is a worthwhile expenditure. And for users who don't want to worry about data backup, the services are a great alternative to no backup at all. — *Steve Rigney*

	@Backup	Atrieva Service	Personal Vault	SafeGuard Interactive
Fee	\$19.95/month per PC	\$14.95/month for 2 PCs	\$1.00/MB (approx.)	\$9.95/month per PC
Contact information	@Backup, San Diego, 619-455-3500 www.atbackup.com	Atrieva Corp. Seattle, 800-287-4382, www.atrivea.com	Network Associates, Santa Clara, CA, 800-332-9966 www.mcafee.com	SafeGuard Interactive, Pittsburgh; 412-415-5200, www.sgii.com

SEAGATE SOFTWARE INC.

Backup Exec for Windows 95, Direct Tape Access

All reviews by M. David Stone



Seagate Software offers two excellent approaches to personal backup. Backup Exec for Windows 95 (\$99 list) is a full-featured and easy-to-use standard backup program; Direct Tape Access (\$79 list) is a backup and personal data management package that lets you treat your tape device as a removable disk.

Backup Exec, which supports just about any type of drive, offers all the features you would expect in a full-function backup program. You can define which drives, directories, and files to back up; you can save as many backup definitions as you need; you can schedule timed backups, and you can restore any copied data to its original location or elsewhere. The program also offers

full disaster recovery under Windows 95, so you can rebuild your hard disk in the event of major data loss. It's easy to learn and use, with all the settings easily adjusted via self-explanatory dialog boxes. On our tests, backing up 100MB to a SyQuest SyJet disk took 3 minutes 48 seconds, compared with about 2 minutes using XCOPY—an acceptable time trade-off for the software's added power and convenience.

Seagate's companion software, Direct Tape Access (DTA), is a Windows 95 or 3.x program that supports cartridge, mini-cartridge, 4-mm, and 8-mm tape drives and lets you use your tape as a removable disk in a manner similar to PGPSoft's Tape-it (also reviewed in this roundup).

On our 100MB backup test, DTA took 9 minutes 25 seconds whether using XCOPY or Copy Exec. This compares favorably with Tape-it's 13 minutes 22 seconds. Combined with DTA's admirable ease of use and its bundled Copy Exec

package, faster performance gives the utility an edge over the competition.

Backup Exec for Windows 95. List price: \$99.
Direct Tape Access. List price: \$79. Seagate Software Inc., Heathrow, FL; 800-327-2232, 407-531-7500; www.seagatesoftware.com. Choose 529 at www.pcmag.com/infolink.

SOFTWARE ARCHITECTS INC.

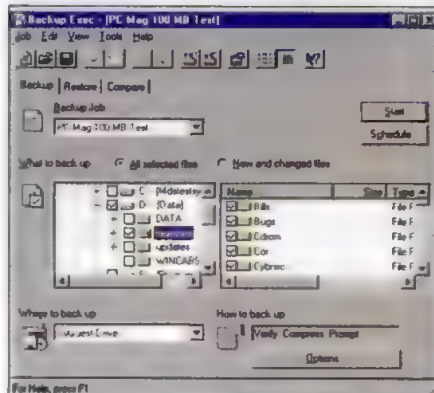
DataSaver Personal Backup

Although it's by far the least sophisticated personal backup utility in this roundup, DataSaver Personal Backup (\$70 street) is also the fastest—and probably the easiest to use as well.

The program is designed for users who want an easy way to back up data to a handy random-access disk drive such as an Iomega Zip Drive. It does not support tape drives. But the package does include separate versions of the software for Windows 3.x, Windows 95, and Macintosh environments—a welcome touch.

DataSaver certainly succeeds in being easy to use. The opening screen includes three list boxes labeled Source, Destination, and Filter. Select a drive (or drives) as the source and a drive as the destination, then choose Entire Drive or some combination of Modified Files, User Data, Applications, and System Files for the filter. When you're done, simply click on Start Backup.

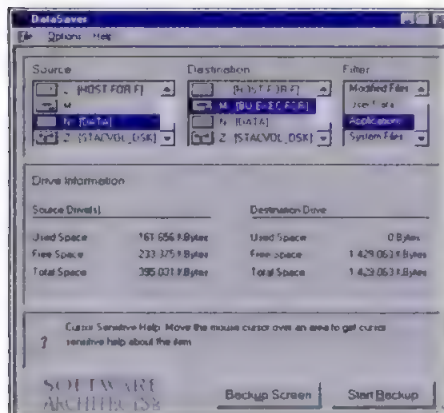
Note that you can't specify directories or files, schedule automatic backups, or store more than one backup definition—for daily, weekly, and monthly backups, for example. There's also no restore feature, although since the program backs up copies of files in standard file format, you can copy them back using Windows Explorer or a



BACKUP EXEC lets you pick files to back up or exclude by checking off directories and files.

DOS COPY command. (Some of these features will be included in Version 3, scheduled for release this spring.)

On our tests, DataSaver turned out to be a speed demon, copying 100MB to the SyQuest SyJet in just 1 minute 28 seconds.



DATASAVR'S emphasis on ease of use shows in this main dialog box.

This surprising speed is a strong argument for the program. If ease of use and speed are all you want for basic backup, DataSaver may be worth a look. For more advanced functionality, look elsewhere. **DataSaver Personal Backup.** Street price: \$70. Software Architects Inc., Bothell, WA; 800-405-0002, 425-487-0122; www.softarch.com. Choose 530 at www.pcmag.com/infolink.

NOVASTOR CORP.

NovaBackup

NovaBackup (\$60 street), available either as a standalone application or as part of NovaStor Corp.'s Security Suite (\$90 street), is a full-function utility with an extensive range of options for different

EDITORS' Choice

→ Backup Exec for Windows 95

Although all of the backup programs we tested will get the job done with a minimum of effort, Seagate Software's Backup Exec for Windows 95 stands above the others and is our Editors' Choice.

Its intuitive interface makes backup easy: Select the files to save, the drive to save to, and the time the backup should occur. Should you need them, more advanced options are just a click away.

Three other products are also worth your attention. NovaStor Corp.'s NovaBackup is a full-featured backup suite that is nearly as intuitive as Backup Exec, and it supports a wide range of operating systems. For users of tape drives, Sea-

gate's Direct Tape Access is a handy utility that lets you access your tape drive as if it were a standard removable drive. It provides its own backup utility as well or can work seamlessly with Backup Exec. And for those who want a minimalist approach to backing up, Safety Net Pro, from CT Software, excels at saving just your crucial files—such as .INI files, registry files, and PIM databases—to a floppy disk or other drive of your choice.



OSs, source drives, and languages. The program's ease of use and flexible interface make it a good choice for most personal backup needs.

The first-rate installation program offers choices for tape drives and disk drives (including hard disks). Each choice comes in Windows 3.x, 95, and NT flavors as well as versions for OS/2 and DOS and can be presented in one of seven different languages. According to NovaStor, the features for all choices are identical. We tested the U.S. English Windows 95 version for disk drives.

Once you've installed the program,

you can specify directories and files to back up (and which files to exclude), create and store multiple backup definitions, and schedule timed backups. You can also restore selected files to their original or alternative locations. The choices for defining a backup are a little less obvious than they might be, but they're not too difficult to understand. One nice touch is an antivirus feature that can check for viruses during the backup or restoration procedure. (NovaStor provides updates to the virus checker on its Web site.) The program also includes a disaster recovery utility so

Backing Up with XCOPY

→ For those users who are comfortable with the DOS command line, free backup is just a C: prompt away.

In many cases, the XCOPY command in DOS will be the only backup program you need. For example, all you may need to do is to back up your Windows directory before you install a new program, should something go awry.

To back up your Windows

directory (and maintain the file structure), first close all programs, including any that automatically load when you boot up, and open a DOS window. Switch to the drive to which you want to back up and create a new directory called WinSafty (as in "Windows Safety"), with the

command:

```
md winsafty
```

Next, back up with XCOPY.

Assuming Windows and Winsafty are in the root directory of your C: drive, the command should read:

```
xcopy c:\windows  
c:\winsafty /c/h/e/k/r/v
```

(For an explanation of the switches, type `xcopy /?` in DOS. Be sure to include them all when you back up.)

Note that although you can't normally use XCOPY to back up to a tape drive, you can if you're running a program such as Direct Tape Access or Tape-it. These programs work by allocating a drive letter to the tape device, thereby fooling XCOPY into thinking the tape drive is a disk drive. —MDS

SAFETY Net Pro: Just the Essentials

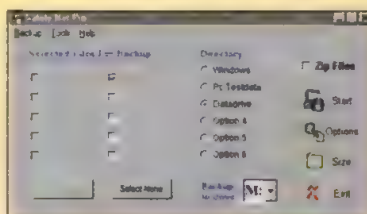
➔ For the minimalists among us, this utility backs up your critical files, but it also offers a bit more than the basics.

Version 6.4 of CT Software's Safety Net Pro (\$21.95 list) is a slim, trim program for people who want a minimalist approach to backing up files. It offers all the basics and a bit more—the ability to restore selected files to your choice of locations and schedule up to four automatic backups per day. But it focuses primarily on backing up essential files you can't afford to lose: .INI files, registry settings,

PIM databases, and the like.

As shipped, Safety Net Pro is set to back up to drive A—which gives you a hint of how many (or rather, how few) megabytes CT Software expects you to back up at once. You can change this and make any other disk on your system the target drive, but you can't use a tape drive. The program comes with one predefined definition for backing up

essential files, including the Windows registry and all .INI files. You can save up to five more custom definitions. Each can name



SAFETY NET PRO'S interface is uncluttered and intuitive.

only one directory, but this can be a root directory. You can also include subdirectories up to seven levels deep. Other options let you include all files, specify files to include by extension, compress the files, or simply copy them.

Safety Net Pro is a surprisingly capable program for the price.

It's a useful tool for anyone who wants to safeguard just the crucial stuff. —MDS

Safety Net Pro, Version

6.4. List price: \$21.95. CT Software, Phoenix; 800-617-7740, 602-765-3136; members.aol.com/ron2222. Choose 528 at www.pcmag.com/infolink.

you can rebuild your hard disk from scratch in the event of major data loss.

On our tests, the disk-based backup was relatively slow, at just over 7 minutes for 100MB. The time did include a second run to verify the backup; you can turn off verify, which is a safe choice when backing up to a disk rather than to tape. All told, NovaBackup is an easy-to-use, highly flexible program that performs quickly and offers a wide range of backup options.

NovaBackup. Street price: \$60. NovaStor Corp., Simi Valley, CA; 800-668-2786, 805-579-6700; www.novastor.com. Choose 531 at www.pcmag.com/infolink.

PGSOFT INC.

Tape-it

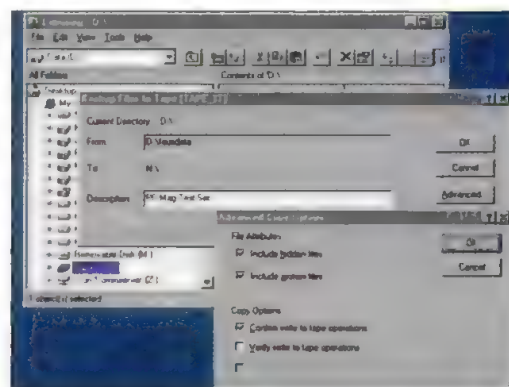
PGSoft's Tape-it (\$60 street), available for Windows 3.x and 95, is a clever and useful

utility for most standard backup functions. Tape-it was the first backup program to treat a tape device as a hard disk—including allocating it a drive letter for easy file transfer—and it's still one of only a few such products on the market.

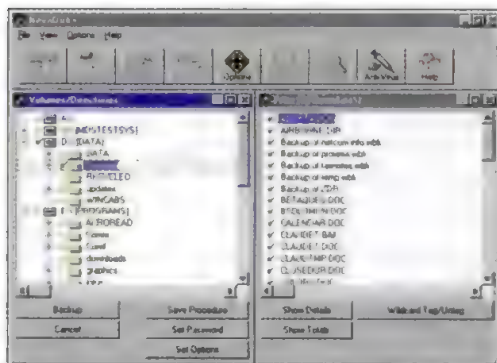
Using Tape-it is a straightforward process. As soon as you install the software, your tape device shows up as a new drive in Windows Explorer, application menus, and DOS. No matter what application you're using, you can move or copy files to or from the tape using any choices the program allows. You can even type a COPY or XCOPY command in a DOS window.

The only important difference between using Tape-it and using a hard disk is the long access times as the utility searches for files stored

tape took another 13 minutes 22 seconds, using an Eagle Nest TR-3 device connected through a floppy disk controller. When we configured Tape-it to back up directly to tape (a simple option that you can set using a pop-up menu),



WHEN YOU DRAG AND DROP files in Explorer, Tape-it offers a pop-up menu that lets you copy files directly to tape.



NOVA BACKUP'S definition screen is a little crowded, but the extra controls make it easy to find options.

on tape. During a given session, however, files aren't usually stored to tape. Instead, Tape-it uses your hard disk as a staging area, so most operations happen at hard disk speeds. The tape device will slow you down only when you need to get a file already on tape or when you give the command to transfer the data to tape.

On our tests, Tape-it took only 2 minutes 28 seconds to back up 100MB to the staging area. But actually transferring the data to

the backup took 12 minutes 23 seconds.

Ultimately, Tape-it's key benefit is ease of use. There's almost nothing to learn, because you can use the programs you're already familiar with. Consider the utility a contender if you want to use your tape for backups without having to learn a new software program. But be sure to take a look at Seagate Software's Direct Tape Access as well.

Tape-it. Street price: \$60. PGSoft Inc., Pacific Grove, CA; 800-549-9001, 408-373-6171; www.pgsoft.com. Choose 532 at www.pcmag.com/infolink. PC

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Akia understands you have enough clutter to cut through at work without having to deal with an aircraft carrier plopped on your desk. And that's not even mentioning the jungle of power cords and cables piling up waiting to envelope you and your co-workers. While Akia LCD systems take up to 80% less space, they're still powerful desktop systems which feature the latest Pentium II processors and huge amounts of storage making it the envy of its bigger neighbors.

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Remember how mom always told you not to sit too close to the television? Well, you're still doing it since your monitor is basically the same thing as a TV. Of course, this is where the Radiance LCD comes into play. It emits less radiation, gives off less heat and uses less electricity, all of which will make you happier and healthier.

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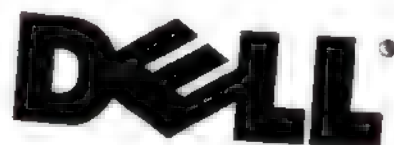
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FILE VIEWERS

view files FASTER

These handy tools extend Windows Quick View and let you have a quick look at just about any type of file without installing the software. By Edward Mendelson

File viewers extend the Quick View feature in Windows. Like Quick View, they let you view files without launching the associated applications or even if you do not have the applications. But these stand-alone file viewers support significantly more file types. They also include enhanced file management features or other extras not found in Windows.

For this story, we tested five programs that emphasize file viewing but also contain some management features. All of them cost less than \$60 (street) with the exception of Cimmetry Systems' AutoVue Professional (\$595 list), a specialized viewer designed for CAD and graphics files.

To view a file, you right-click on a filename in Explorer and select the viewer from a context menu or open a file from the viewer's dialog box. Either way, you can generally view a

broad range of file types with varying degrees of success. Basic word processor and spreadsheet files appear with some or all formatting intact. When viewing graphics files, you can zoom in and out. Many programs display common presentation formats such as Microsoft PowerPoint, but surprisingly few can display the common database formats.

If you choose, you can also view files in text or hex mode. If you plan to view files only in these modes, you may opt for a dedicated text viewer such as the classic DOS-based LIST Plus (\$37 for a single user) by Vernon Buerg (www.buerg.com) or WnBrowse (free) from Nigel Thomas (www.maui.net/~dml/wintxt.html).

File viewers also vary widely in their support for ZIP and other compression formats: Some display such files or even create ZIP files. Most convert bitmap files to other formats; some can convert among other file types. With one of these viewers, you'll almost never be caught wondering what's inside that file you can't open.



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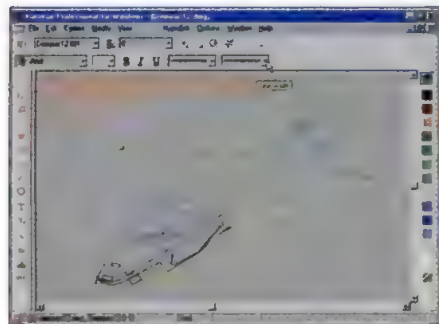
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CIMMETRY SYSTEMS INC.

AutoVue Professional

All reviews by Edward Mendelson

With unique markup and thumbnail features, along with viewers and converters for advanced CAD and PostScript files, Cimmetry Systems' AutoVue Professional (\$595 list) offers a sophisticated feature set for viewing and managing CAD and graphics files. But perhaps in reaching so high



AUTOVUE PROFESSIONAL'S markup feature overlays images with annotations and drawings.

Cimmetry neglected the simpler stuff, as AutoVue Professional lacks some of the basics found in more general file viewers.

AutoVue Professional displays most standard word processor, bitmap and raster graphics, spreadsheet, database, and compression formats used in Microsoft DOS and Windows (plus most major Unix and Macintosh graphics formats), as well as AutoCAD files and other major CAD formats. When viewing CAD drawings, you can specify which layers and blocks to display, designate coordinates for viewing points, and use pan, zoom, bird's-eye, and magnifying-glass tools.

A rich set of markup tools lets you overlay images with text, hyperlinks, sticky notes, lines, and symbols and then save the overlays as separate files. For those who don't need the markup tools, Cimmetry offers a more basic version, AutoVue (\$395 list).

Though AutoVue Professional's advanced features are well implemented, the program falls short on some fundamentals. For example, it displays all word processor files in formatted view only; you can't display just text. On our tests, WordPerfect files containing graphics appeared as blank pages. Word

EDITORS' Choice**→ Quick View Plus 4.5**

The best file viewer available is an upgrade to the one you already get with Windows 95. Inso Corp.'s Quick View Plus 4.5, the full version of the Quick View viewer bundled with Windows 95 and

Windows NT 4.0, offers the most comprehensive selection of filters and seamless integration with Windows. It once again secures our Editors' Choice.

Quick View Plus displays nearly all standard word processing, bitmap and raster graphics, presentation, spreadsheet, database, multimedia, and compression formats—including Microsoft Office 97 formats. Web pages and other Internet-related files are displayed with "live" hyperlinks, and Quick View Plus can be used as a Netscape Navigator plug-in or ActiveX viewer.



Though Quick View Plus forgoes some of the extra file management features found in other programs, it does offer some convenient features of its own. You can "pin" the viewer window to the desktop or to the side of an Explorer window. Quick View Plus then opens each new file in the same window. And it offers the best text-search tools.

Another file viewer, Cimmetry Systems' AutoVue Professional, deserves mention here for its special capabilities. It is the best choice for viewing CAD files and includes innovative markup and automation tools.

97 documents showed only words, not images—sometimes in hex format instead of text. Excel 97 files also appeared in hex format. In addition, links in HTML files are not "live," as they are in the other viewers we reviewed. Cimmetry plans to fix many of these problems in a maintenance release that should be available around the time you read this.

AutoVue Professional provides more than most users need, but engineering professionals and those who need its markup and automation tools will find its high price justified by those advanced features.

AutoVue Professional. List price: \$595. Requires: 486-based PC or better, 8MB RAM, 4MB disk space, Microsoft Windows 3.x or later or Windows NT 3.51 or later. Cimmetry Systems Inc., Saint Laurent, Quebec, Canada; 800-361-1904, 514-735-3219; fax, 514-735-6440; www.cimmetry.com. Choose 509 at www.pcmag.com/infolink.

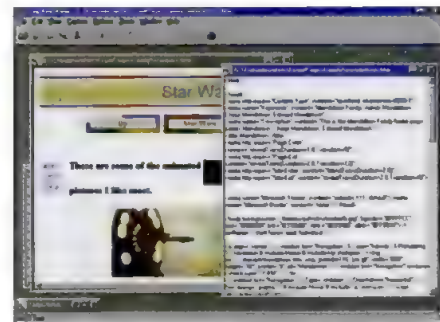
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CANYON SOFTWARE

Drag And View

A shareware package, Drag And View (\$35 street) includes useful features such as screen capture and a text editor not found in rival products. But a few flaws prevent it from joining the top tier.

Drag And View can display word processor files in text mode only, but it doesn't display columns or embedded graphics. It supports the most common



DRAG AND VIEW displays HTML files and includes a text editor.

word processing, spreadsheet, database, and multimedia formats, and it converts common bitmap graphics formats. A version called Drag And View DWG (\$95 street), which we did not test, also views,

You can run Drag And View as a standalone program or launch it from the right-click context menu in Windows Explorer. Drag And View displays files in ASCII, hex, and formatted views, and you can keep multiple files open in the main window. Browser-style toolbar icons let you navigate among files. Drag And View also displays HTML files using Microsoft Internet Explorer's viewing module.

To open the built-in text editor, you turn on the Editor option from the toolbar or menu. The editor lets you modify only text files (if you attempt to modify program or image files, you may render them unusable). Drag And View has a text-search feature, but it doesn't remember earlier search strings as Quick View Plus does. And when displaying ZIP archives, Drag And View shows only a directory of the files contained in the archive; it can't extract or display the files.

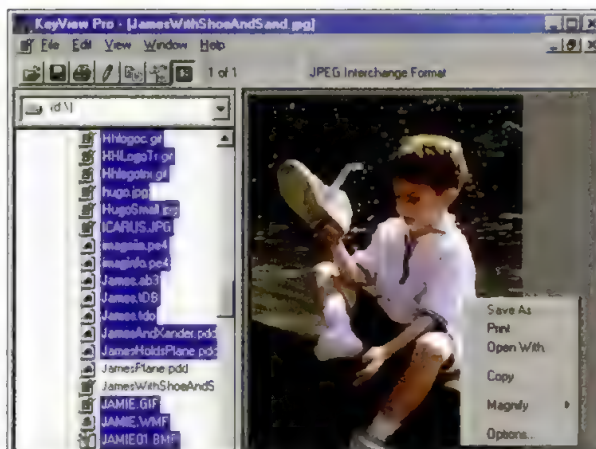
A promising file viewer, Drag And View offers an attractive combination of features and good performance at a low price. But its search tools and ZIP support need some fine tuning.

Drag And View. Street price: \$35. Requires: 486-based PC or better, 8MB RAM, 4MB disk space, Microsoft Windows 95 or Windows NT 4.0. Canyon Software, San Rafael, CA; 800-280-3691, 415-453-9779; fax, 415-453-6195; www.canyonsw.com. Choose 510 at www.pcmag.com/infolink.

VERITY INC.

KeyView Pro

Most file viewers won't let you do anything to a file other than view it or copy it to another folder on your disk. But Verity's KeyView Pro 6.0 (\$40 street) adds compression, encryption, and conversion features. Although this approach is commendable, KeyView still lacks a few of the fundamentals of file viewing, and the product's conversion features need work.



THE KEYVIEW PRO viewer doubles as a file manager.

You can run KeyView as a standalone program from the Start menu or desktop or as a pop-up viewer from the right-click context menu in Explorer. An optional dialog box, similar to those found in file management programs, allows you to sort through a list of files in the left pane while viewing the selected file on the right.

KeyView can save files to other directories and can convert them individually or in a batch to any standard format (including HTML, RTF, and TXT). Oddly, you have to use batch mode to convert between word processing formats; you can't convert one file at a time. A separate compression utility stores one or more files in BinHex, TAR, uuencoded, Z, or ZIP archives.

The viewer displays word processor files in either plain-text, formatted, or hex mode. The plain-text mode displays all the

"garbage" characters in the file's header in addition to the text itself, and unlike Quick View Plus, KeyView Pro doesn't include an option to display only the text. A convenient feature of KeyView lets you split the window into two views to look at different portions of a word processing file simultaneously—or use one window for a formatted view and the other for a hex view. Also unlike

Quick View Plus, KeyView has a text-search dialog that doesn't remember your most recent search strings.

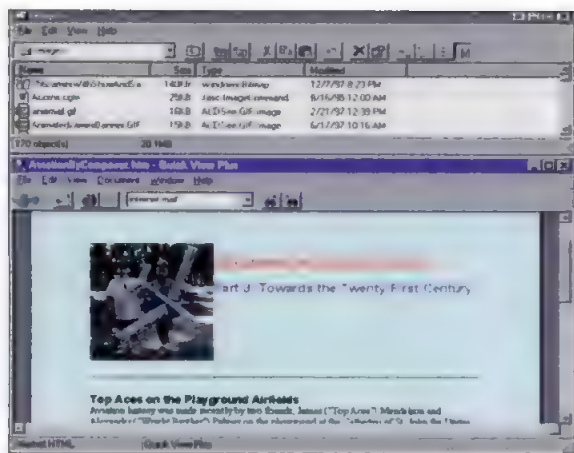
Graphics, spreadsheet, and text files open quickly and are displayed accurately. KeyView can use standard Web browser plug-ins for viewing Adobe Acrobat, AutoCAD, RealAudio, and a few other common file formats. But KeyView can't display database files, not even in the industry-standard dBASE format.

Unless you have a need for KeyView's built-in compression and conversion capabilities, you'd be better off using a product with a wider range of filters and stronger search functions, such as Quick View Plus. **KeyView Pro 6.0.** Street price: \$40. Requires: 486-based PC or better, 4MB RAM, 5MB disk space, Microsoft Windows 3.x or later or Windows NT 4.0. Verity Inc., Sunnyvale, CA; 408-541-1500; fax, 408-541-

SUMMARY OF FEATURES

File Viewers

	AutoVue Professional	Drag And View	KeyView Pro 6.0	Quick View Plus 4.5	Turbo Browser 98
Price	\$595 (list)	\$35 (street)	\$40 (street)	\$50 (street)	\$60 (street)
Installs as a standalone viewer	■	■	■	■	■
Searches for text in files	■	■	■	■	■
Converts graphics formats	■	■	■	■	■
Converts word processor formats	■	■	■	■	■
Displays unregistered file types	■	■	■	■	■
Contains a hexadecimal viewer	■	■	■	■	■
Displays newspaper-style columns (text flows from column to column)	■	■	■	■	■
File management features	■	■	■	■	■
Zoom feature	■	■	■	■	■
New viewers added as separate files	■	■	■	■	■
Can be used as a browser plug-in	■	■	■	■	■
HTML hyperlinks are live	■	■	■	■	■



QUICK VIEW PLUS can "pin" itself to any side of an Explorer window.

1600; www.keyview.com. Choose 511 at www.pcmag.com/infolink.

INSO CORP.

Quick View Plus

PC MAGAZINE EDITORS' CHOICE If you accepted the default options when you installed Microsoft Windows 95 or Windows NT 4.0, you already have Quick View on your system. Written for Microsoft by Inso Corp., Quick View provides basic filters for common word processing, spreadsheet, and bitmap and raster graphics formats. For \$50 (street), however, you can—and should—upgrade to Inso's flexible and powerful Quick View Plus 4.5, which contains a wider selection of filters and integrates with Windows as tightly as Quick View itself.

Quick View Plus displays nearly all standard word processing, bitmap and raster graphics, presentation, spreadsheet, database, multimedia, and compression formats, including AutoCAD, Lotus 1-2-3 97, and Microsoft Office 97. And Quick View Plus uses the same free third-party plug-ins that Web browsers use for viewing files in Adobe Acrobat, CorelDraw, Macromedia's Shockwave, and other proprietary formats. But unlike KeyView Pro, Quick View Plus won't convert files.

Quick View Plus can "pin" its window to the desktop or to the side of an Explorer window. In "pinned" mode, Quick View Plus opens each new file in the same window (like a file manager); in normal mode, each new file opens in a separate window.

You can view all files in their native formats or in hex or text modes, and you can

rotate or zoom graphics images or use them as wallpaper. Quick View Plus displays word processor files in text-only draft mode or in partly or fully formatted modes. Multiple-page spreadsheets and presentations in formats such as Microsoft PowerPoint appear with tabs for navigating between pages. Web pages display with "live" hyperlinks, and uuencoded attachments in e-mail messages show up as links that you can click on to view attachments in separate windows. The text-search feature remembers

search strings you've used.

Quick View Plus automatically acts as the viewer for all third-party programs that use Quick View, such as Norton Navigator and Mijenix's PowerDesk. You can also install it as the standard viewer for all major browsers and e-mail clients such as Lotus Notes and Qualcomm's Eudora, and Quick View Plus works as a plug-in to Netscape Navigator or an ActiveX document viewer for Microsoft Internet Explorer.

Fast, powerful, and unobtrusive, Quick View Plus is an easy choice.

Quick View Plus 4.5. Street price: \$50. Requires: 486-based PC or better, 8MB RAM, 5MB disk space, Microsoft Windows 3.x or later or Windows NT 4.0. Inso Corp., Boston; 800-733-5799, 617-753-6500; fax, 617-753-6666; www.inso.com. Choose 512 at www.pcmag.com/infolink.

PACIFIC GOLD COAST CORP.

Turbo Browser 98

Pacific Gold Coast's Turbo Browser 98 (\$60 street) stands out more as a sleek file manager than a viewer. It fits on a single floppy disk and finds, views, converts, manages, compresses, and encrypts files more efficiently than far bigger packages such as Norton Commander. Yet it ultimately can't replace Windows Explorer as a file manager, and its file-viewing capabilities are less extensive than those of other products reviewed here.

Turbo Browser works like an elaborate shell built around but separate from Windows Explorer. It shows fast previews of most standard bitmap and raster graphics, word processing, spreadsheet, multimedia, and HTML files; it also lets you rename a

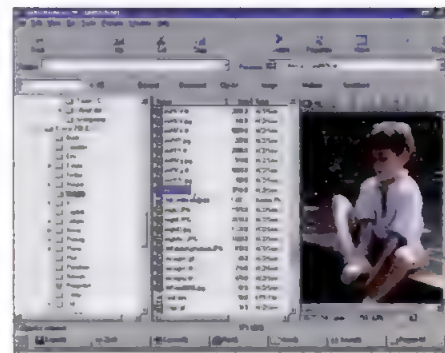
group of files in a single operation, extract the ASCII text from word processing files, find files using fuzzy or exact text searches, and change the dates and attributes of files.

Turbo Browser uses the file-viewing features built into Internet Explorer (if you have it on your system) and uses Microsoft ActiveX controls to preview Microsoft Office documents, complete with formatting. But it doesn't support database formats or less common formats that AutoVue, KeyView, and Quick View Plus can handle.

The Qbar is a powerful if unusual feature: You drag filenames from the main window to its buttons. For example, the Export button stores the names of files that you want to copy to another disk, and the Zip button stores names of files you want to compress into a ZIP file. Other buttons batch-process graphics or sound files. You can also create your own buttons.

A few glitches appeared during testing. For example, when you delete a file from a folder list, the preview window remains open (as if the file still existed), and you can't delete a file if it appears in a preview window that uses ActiveX. Finally, when you click on the refresh button in the toolbar on graphics preview windows, all the buttons on the toolbar turn blank.

These glitches are minor. Turbo Brows-



TURBO BROWSER 98 has three main windows for folders, file listings, and file previews.

er is a capable extension to Windows Explorer for file management. But other utilities reviewed here offer more robust file viewing.

Turbo Browser 98. Street price: \$60. Requires: 486-based PC or better, 2MB disk space, 8MB RAM, Microsoft Windows 95. Pacific Gold Coast Corp., Glen Cove, NY; 800-732-3002, 516-759-3011; fax, 516-759-3014; www.turbobrowser.com. Choose 513 at www.pcmag.com/infolink. **PC**

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MISCELLANEOUS UTILITIES

take CARE of other tasks

From compressing files to enhancing printer output, this assortment of utilities will help you get the most out of your PC. By John Morris

Antivirus programs, troubleshooting utilities, uninstallers—all are well-known categories of products that accomplish a variety of tasks. Off this beaten path, however, you'll find a host of other little programs that, true to the tradition of PC utilities, make life a bit easier by taking care of specific computing chores.

This section covers a broad range of utilities that exemplify this concept. Some will appeal to nearly all users; others are designed mainly for enthusiasts. No matter

how you use your PC, you'll find something valuable among these 32 products.

One of the most hotly contested categories this year is file compression. We found no fewer than seven utilities vying to zip your files, but it was the originator of the category, PKWare's PKZip for Windows, that came out on top and earned a spot in this year's Essential Toolkit. *Hard disk utilities* is a catch-all that includes products for viewing, duplicating, and slicing up data on your disk. Other storage-related utilities, such as Synchrony's Softcorp's BigDisk and PGSoft's Gimme Space, work in tandem with removable drives to free up space.

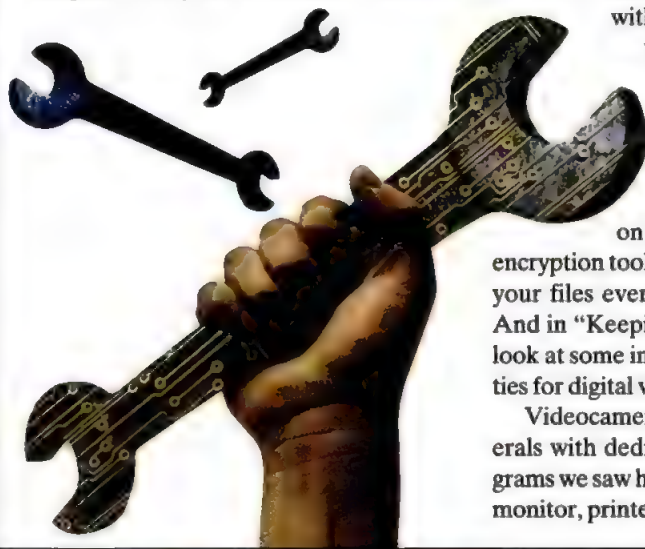
Security has become a hot topic. The data security tools reviewed here can help protect your PC and its contents at work, on the road, or at home. Data encryption tools bar others from getting at your files even if your laptop is swiped. And in "Keeping an Eye on Things," we look at some innovative surveillance utilities for digital videocameras.

Videocameras are not the only peripherals with dedicated utilities. Other programs we saw help get the most out of your monitor, printer, and sound system.

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FILE COMPRESSION

All reviews by Douglas Giles

The choices for creating and managing archives are numerous. We looked at seven Windows compression utilities that provide graphical interfaces and drag-and-drop zipping and unzipping of files.

Each of these programs can create archives that span multiple disks, password-protect archives, create self-extracting files, and—with the exception of Nico Mak Computing's WinZip—add comments. Special features include the ability to automate regular compression routines and repair damaged archives, a "check-out" feature for viewing files temporarily, and background compression and decompression.

On our tests, all seven programs created archives within 5 percent of one another in size when set for maximum compression. Two programs, however, PKWare's PKZip for Windows and Pacific Gold Coast Corp.'s TurboZip 97, were 25 to 40

arrangement, and it is a minor annoyance in an otherwise capable application.

The interfaces for Drag And Zip and Zip View are not the most intuitive ones we saw, but they have the necessary features and options along with some extras. In Zip View you can view files, scan for viruses, or view an archive temporarily using the

Check Out feature. Check Out unzips a file and puts the extracted files temporarily in a Check Out program group on the Windows Start menu so you can view or run them.

When you're done, you can delete the extracted files and the Check Out group automatically, or save the group under

another name. If you frequently make archives of the same files, a Zip Set automates the task.

Zip View can extract BinHex, GZIP, LZH, MIME, TAR, uuencoded, and xxencoded files. Drag And Zip can create MIME and uuencoded files. (Canyon Software, 415-453-9779, www.canyonsw.com. Choose 510 at www.pcmag.com/infolink.)

If you love utilities, head for our Web site to check out **INTERACTIVE SUMMARIES** of features, download demos, and www.pcmag.com/features/utilities98/ join in **DISCUSSIONS**. We'll also have animated **WALK-THROUGHS** of the best products.

when each file was created and its compressed and uncompressed sizes, compression ratio, attributes, and paths—but not the uncompressed size of the entire archive. You perform zipping and unzipping operations by means of toolbar buttons. The interface is functional but cluttered and difficult to read.

MicroHelp Zip can extract LZH, TAR, and uuencoded files, and you can save uuencoded files. Although MicroHelp Zip is a reasonably useful product, nothing sets it apart from the pack. (Luckman Interactive Inc., 800-711-2676, 770-516-0899, www.luckman.com. Choose 675 at www.pcmag.com/infolink.)



• The original compression program, PKZip, has shed its DOS roots for a more user-friendly graphical interface but retains its power and performance. We tested **PKZip 2.60 for Windows** (\$49 list), which is available in both 16-bit and 32-bit versions. An optional Wizard makes zipping and unzipping files easy; most tasks can be handled in seconds by following the step-by-step instructions. A standard, more "hands-on" interface is also available.

The strengths of PKZip lie in its interface and speed. Its dialog boxes are the easiest to read among all these products, and they provide the most information. When you open an archive, you can see when each file was created and its compressed and uncompressed sizes, compression ratio, compression type, file attributes, and path. This latest version can also import the list files used in earlier versions to automate common ZIP tasks.

PKZip can read and extract BinHex, GZIP, MIME, TAR, uuencoded, and xxencoded files. You can search for and sort files by name, size, and date. (PKWare Inc., 414-354-8699, www.pkware.com. Choose 645 at www.pcmag.com/infolink.)

• Although it's an innovative program, **TurboZip 97** (\$40 street) starts out on the wrong foot. Its 16-bit installation program will not create a Start menu item or a desktop shortcut if you attempt to use long filenames; if you follow the on-screen instructions exactly, however, it will work properly.

TurboZip's main view allows you to see the contents of a file just by clicking on it. By double-clicking on an archive, you

	Filename	Date	Time	Orig Size	Comp Size	Method
1	13cover.gif	4/17/97	10:42:54 pm	18,384	18,384	Stored
2	3 column.htm	4/29/97	4:36:34 pm	1,850	535	DeflatedX
3	AMCA 4-10.doc	5/13/97	5:27:56 pm	32,768	11,707	DeflatedX
4	AOL1.DOC	10/29/97	2:19:24 pm	3,079	1,829	DeflatedX
5	AUDVID.DOC	7/7/97	12:57:40 am	27,648	5,637	DeflatedX
6	CANDID2.DOC	10/26/97	7:21:44 pm	32,768	8,160	DeflatedX
7	CIVILWAR.TXT	10/24/97	9:32:42 pm	6,012	2,620	DeflatedX
8	DMGRES.DOC	10/14/97	10:39:06 am	14,848	3,713	DeflatedX
9	DOC3.DOC	10/26/97	11:13:26 am	7,168	1,585	DeflatedX
10	DODDINV1.DOC	6/16/97	9:32:44 pm	30,720	5,580	DeflatedX
11	DODDINV2.DOC	6/16/97	9:32:44 pm	32,256	5,530	DeflatedX

PKZIP EARNS POINTS for providing the most detailed information on archives in a simple format.

percent faster at creating ZIP files.

What distinguishes a ZIP utility is its interface, the amount of information it provides about archives, and the extras it includes. All the programs reviewed here will get the job done, but PKZip delivered the best combination of features.

• **Drag And Zip** (\$30 street) splits zipping and unzipping into two modules: Drag And Zip compresses files, and Zip View decompresses them. There is no advantage to this

• **Luckman's MicroHelp Zip** (\$29.95 list) comes in two versions: one for Windows 95 and Windows NT (32-bit) and one for Windows 3.x (16-bit). The setup program will detect the operating system installed on your PC and install the appropriate version.

MicroHelp Zip's main screen is a Windows Explorer clone from which you can copy, move, and delete files. When you open an archive, MicroHelp Zip tells you

can determine whether the file structure is corrupted, the number of files in the archive, and the total size of the files once they are uncompressed. You can search for files within archives by filename and by file type, size, date, or attributes.

The Add Wizard and Extract Wizard lead you step by step through creating and extracting archives. You can create a Zip Set to view all of your archives at once and save frequently zipped sets of files as an Auto Backup Set.

TurboZip extracts ARC, ARJ, BinHex, GZIP, LZH, MIME, TAR, uuencoded, and xxencoded files. Although TurboZip is based on some great ideas and is one of the fastest programs we tested, it needs an update. (Pacific Gold Coast Corp., 800-732-3002, www.turbozip.com. Choose 676 at www.pcmag.com/infolink.)

• Perhaps the best-known Windows compression program, **WinZip** (\$30 street) has won much praise over the years. Although it is certainly a good application, other ZIP utilities have passed it by in terms of features.

Version 6.3 of WinZip works in two modes: using either the WinZip Wizard or the "classic" WinZip interface. The wizard makes unzipping files easier and automatically runs setup or install programs found within a ZIP file. The wizard only unzips files, however; it will not zip them. You can zip files only using the classic interface, by means of a toolbar button or using drag-and-drop. This dialog box is not as easy to read as those of some other applications. WinZip offers a CheckOut feature that works the same way Drag And Zip's Check Out feature does.

One drawback of WinZip is that support for virus checking and for ARC, ARJ, and LZH files is available only through third-party programs. WinZip can extract BinHex, GZIP, MIME, TAR, uuencoded, and xxencoded files. (Niko Mak Computing Inc., 800-242-4775, www.winzip.com. Choose 677 at www.pcmag.com/infolink.)

• **Zip-It** (\$40 street) is the only application that came on a CD; the rest came on one or two floppy disks. The main Zip-It screen gives you quick and detailed information on the files in archives. You can instantly see when the files within a ZIP file were created, their compressed and uncompressed sizes, their compression ratios, file attributes, and paths. You can

also sort the files within an archive according to those attributes.

One time-saving feature is Zip/Unzip-in-place—a shortcut from the Explorer screen. Right-click on a file or files, select Zip-It In Place, and you will create an archive in that directory. A Check Out feature is available, but it does not create a program group like the analogous features in WinZip or Drag And Zip. Zip-It can extract ARC, ARJ, LHA, TAR, TAZ, and TGZ files. It's a solid application, but there's no compelling reason to choose it over other ZIP utilities. (Quarterdeck Corp., 800-683-6696, www.quarterdeck.com. Choose 506 at www.pcmag.com/infolink.)

• The most innovative ZIP utility reviewed here, **Zip-Magic** (\$40 street) lets you use files in archives on the fly, without having to unzip them manually. It also performs traditional archiving operations.

ZipMagic adds to Windows 95 the ability to display ZIP files as regular folders with a .ZIP extension. These folders are visible to all other applications, and you can use them as if they were regular folders. You can even run applications directly from within an archive. ZipMagic performs compression and decompression automatically, at the operating-system level. You can thus save disk space by using compression without changing your normal work routines.

Designed to work as a supplement to Explorer, ZipMagic provides a functional but crowded interface with tiny buttons. A Convert Folder to Zip command will zip a selected folder. You can also compress a folder by simply renaming it and adding the .ZIP extension.

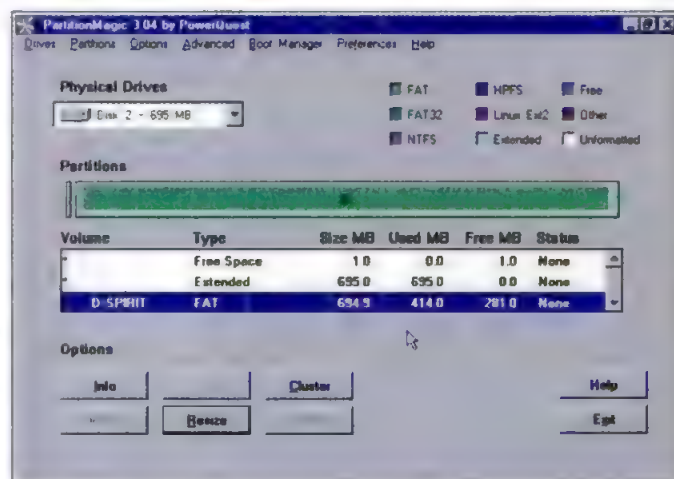
When it comes to creating and extracting archives, however, ZipMagic is not as easy to use as the other utilities we saw; neither does it give as much information about the files in an archive. ZipMagic extracts ARJ, BinHex, CAB, GZIP, LHA, LZH, MIME, TAR, TGZ, uu-

encoded, xxencoded, and ZOO files. Zip-Magic's novel approach will appeal to certain users, but for traditional ZIP chores, there are better choices here. (Mijenix Corp., 800-645-3649, www.mijenix.com. Choose 678 at www.pcmag.com/infolink.)

DISK UTILITIES

All reviews by David Haskin

Popular disk maintenance utilities such as Symantec's Norton Utilities' Disk Doctor are indispensable, but they don't perform all hard disk maintenance tasks. We evaluated several hard disk utilities that address other chores such as viewing data on your hard disks, creating



THE POWERFUL PartitionMagic slices up hard disks and resizes clusters to maximize disk space.

exact images of a hard disk, and partitioning disks.

• If you think in terms of pictures, not words, you'll like **DiskMapper 2.0** (\$50 street). DiskMapper displays all the content on your hard disk as a "map" with rectangles proportional to the size of the folders and files they represent. To the left, DiskMapper lists the corresponding filenames and sizes in a directory tree. The map helps you in quickly locating files that are hogging disk space and determining which can be removed safely.

DiskMapper's search capability is particularly useful. If you regularly download files from the Internet, for instance, you can search for ZIP and the resulting map will show you which folders contain the greatest number of archived files. On our tests, we were surprised at the ZIP files we had downloaded and forgotten.

It took a while to understand the program's maps. And DiskMapper's Advisor



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feature, which is designed to provide details about each file, rarely provided useful information. But it's good for helping you to understand the makeup of your hard disk, and to reclaim space. (Micro Logic Corp., 800-342-5930, www.miclog.com. Choose 679 at www.pcmag.com/infolink.)

- Like other drive-imaging tools, **Drive Image** (\$70 street) is a DOS program that creates images of specific partitions or entire drives. Beside copying the compressed image to a removable disk, you can also copy it to another physical disk on the same PC—a good way to get up and running quickly when you add a new, bootable hard disk to a PC. If you need only this feature, opt for PowerQuest's **DriveCopy** (\$30 street).

Drive Image supports the FAT16, FAT32, NTFS, and HPFS file systems. (NTFS and HPFS are the file systems for Windows NT and IBM's OS/2, respectively.) Drive Image can examine your system and find disk errors before it copies data. But when it found disk errors on our tests, it stopped operation yet provided no information about the problem. PowerQuest also includes **MagicMover** for transferring applications, as well as **DriveMapper** for updating configuration files so applications run properly after drive letters have been changed.

On the downside, Drive Image can't resize partitions automatically. To do that, you must use a product such as PowerQuest's **PartitionMagic**. A corporate version, **Drive Image Professional** (\$695 street), supports scripts for automating network installation. (PowerQuest Corp., 800-379-2566, www.powerquest.com. Choose 630 at www.pcmag.com/infolink.)

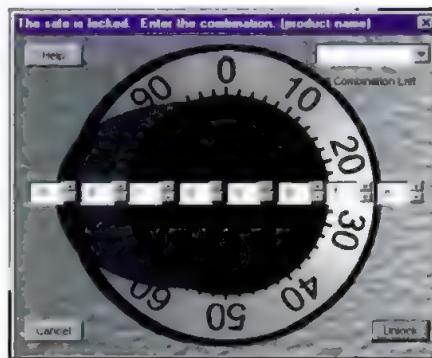
- A powerful drive-imaging product, **Ghost Personal Edition** (\$60 street) has attracted a loyal following. Ghost has a retro-DOS interface (it should be replaced by a graphical user interface by the time you read this). Nevertheless, its step-by-step approach to capturing and restoring images makes it easy to use. Ghost supports FAT12, FAT16, FAT32, and NTFS but not HPFS.

Ghost Multicast (\$2.50 to \$20 per workstation) adds an attractive feature for enterprises: It can multicast image files over a TCP/IP network to workstations running the client version. This means IS personnel don't have to visit each work-

station to install software. In addition, Ghost Multicast can generate a unique security identifier (SID); Drive Image requires a separate, free utility for that task. (Innovative Software Ltd., 800-817-5119, www.ghostsoft.com. Choose 680 at www.pcmag.com/infolink.)

- Designed for the larger hard disks common on today's desktop systems, partitioning utilities let you manage large disks and recapture some of the disk space squandered by large clusters. Although it lacks support for HPFS and NTFS file systems, Quarterdeck's **Partition-It Extra Strength**, Version 1.03 (\$60 street), is easy to use. Its wizards walk you through the process of adding, deleting, and resizing partitions and changing cluster size.

Even if you disregard the wizards, you'll



NOVASTOR-AUTHENTEX DATASAFE uses a familiar metaphor for locking and unlocking files.

still find the interface easy to use. When you change or delete partitions, Partition-It can automatically examine your registry and other configuration files and update your system. This feature generally worked well, although it failed to update two shortcuts in our Windows Startup folder, and those programs wouldn't load until we manually changed the shortcuts. The unit comes with the excellent multiboot utility **Select-It**, which includes access control for specific partitions. (Quarterdeck Corp., 800-683-6696, www.quarterdeck.com. Choose 506 at www.pcmag.com/infolink.)

- The power users' partitioning utility, **PartitionMagic**, Version 3.04 (\$70 street), handles the toughest hard disk tasks. It let us change the cluster size on an old Seagate Caviar drive to as little as 2K; by contrast, Partition-It refused to reduce the cluster size any more than to 16MB. PartitionMagic supports FAT16, FAT32 (which requires Windows 95, Service Release 2), HPFS, and NTFS file systems.

It lets you boot multiple operating systems from separate partitions, with each using its optimal file system. PartitionMagic offers diagnostic tools, such as the ability to check for partition errors.

PartitionMagic is a DOS program, but the interface is up to date and relatively easy to use. It also comes with the utility **MagicMover** for transferring applications. Unlike Partition-It, PartitionMagic doesn't automatically update configuration files such as the Windows 95 registry when you switch drive letters in adding or deleting partitions; instead, you must use the included (yet separate) **Drive Mapper**.

Also included is IBM's **Boot Manager**. Compared with the other multiboot utilities reviewed later in this section, Boot Manager is disappointing. For instance, it lacks the ability to control user access to specific partitions. (PowerQuest Corp., 800-379-2566, www.powerquest.com. Choose 630 at www.pcmag.com/infolink.)

DATA SECURITY UTILITIES

All reviews by Michael L. Schneider

If your notebook were stolen, could anyone read the files you've stored there? For most of us the answer, unfortunately, would probably be yes. A data security tool can prevent information from getting into the wrong hands. You should choose the one that best meets your usage profile.

- A corporate rather than consumer product, **Encryption Plus for Hard Disks** (\$129.95 list) is a no-frills utility. It includes a password-controlled screen saver and an assembler-based encryption engine. The product works with hard disks only, and the version we tested (4.02) was limited to 2GB drives and did not support FAT32. Version 4.03, which should be shipping by the time you read this, will support FAT32 and up to two drives with as many as ten 8GB partitions.

Hard disks are secured with a master password as well as a daily code. A one-time code makes Encryption Plus suitable even for high-security environments. Encryption Plus also has a modest footprint: It will run on any 386-based or faster PC. (PC Guardian, 800-288-8126, www.pcguardian.com. Choose 681 at www.pcmag.com/infolink.)

- A versatile data security utility, **Norton Your Eyes Only** (\$90 street) addresses the needs of both consumers and corporate users. It lets you encrypt and decrypt files

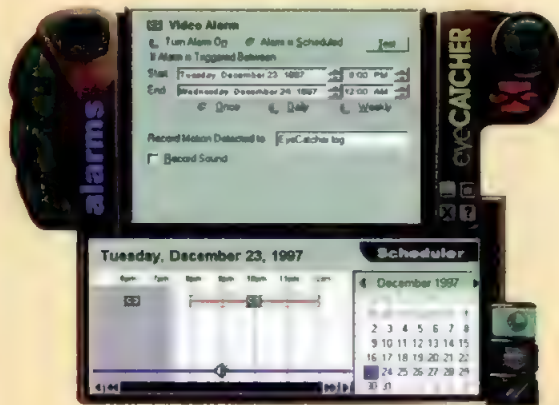
Keep an EYE on THINGS

➔ These novel surveillance utilities add a new dimension to desktop security. By Sheryl Canter

Not all security utilities have to be serious all the time. When you combine advanced software with an inexpensive desktop video-camera, the results can be entertaining as well as useful. These software surveillance systems are designed to detect movement and begin recording automatically. When movement stops, the camera stops recording. Besides keeping detailed logs of comings and goings, they can also notify you or play a .WAV file when they detect an intruder.

We tested three surveillance systems. eyeCatcher and Gotcha! 2.0 rely on motion detection only; FaceIt PC can also use face recognition technology to control access to your PC. All three work with any Microsoft Video for Windows-compliant camera. We used a Sillcon Vision iCam 512N color digital videocamera (\$200 street).

The numbers in square brackets can be selected at www.pcmag.com/infolink for product information.



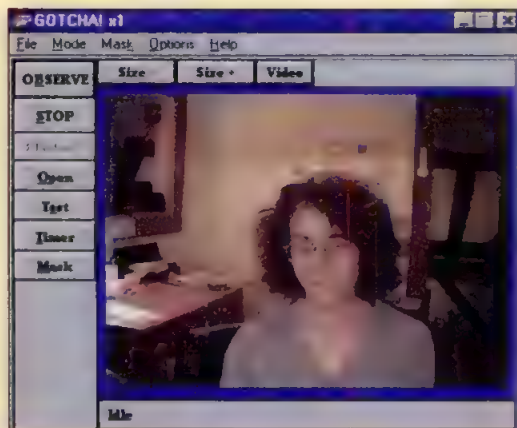
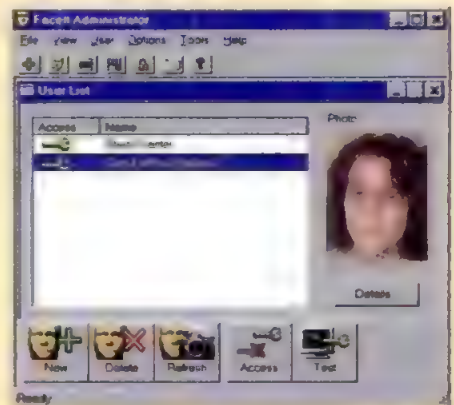
◀ eyeCatcher

Despite its colorful and unusual interface, eyeCatcher (\$50 street) takes itself seriously. Synchronys SoftCorp bills eyeCatcher as a high-tech surveillance system. The product offers four types of "alarms" or responses to movement in the camera's field of vision. It can turn on video and sound recording, send you a fax or e-mail message with several frames of video, dial the telephone, or play a .WAV file.

A log file lists all the events that occurred while eyeCatcher was active, and the password feature lets you lock your system when eyeCatcher is active. The program also offers a motion sensitivity control, and you can include or exclude areas of the visual field from monitoring. (Synchronys SoftCorp., 888-777-5600, www.synchronys.com.) [540]

FaceIt PC ▶

FaceIt PC (\$149.95 list) is a security suite that controls access to your system using face recognition. The surveillance feature logs snapshots of faces along with the dates and times they were taken. An option lets you continue to record video after a face is recognized. You can create text and HTML versions of the access log. A separate encryption feature lets you encrypt and decrypt files with either an image of your face or a password. And the visual messaging feature lets you leave a recorded video message for people who stop by while you're out. Visitors can leave their own photo messages. FaceIt PC is a great demonstration of futuristic technology. (Visionics Corp., 201-332-9213, www.faceit.com.) [686]



◀ Gotcha! 2.0

A "recreational surveillance" product, Gotcha! 2.0 (\$44.95 list) is the cubicle dweller's revenge. Besides recording, when motion is detected Gotcha! can minimize itself or another program, play a .WAV file, launch a program, or send a pager message. When someone enters your office, Gotcha! can sound an alarm and minimize both itself and another application, such as Solitaire. Four recording modes plus options such as hold time, clip length, and sensitivity to change let you record just what you want. Gotcha! 3.0, a 32-bit version that handles multiple camera inputs, should be available by the time you read this. (Prescient Systems, 650-366-5816, www.gotchanow.com.) [687]

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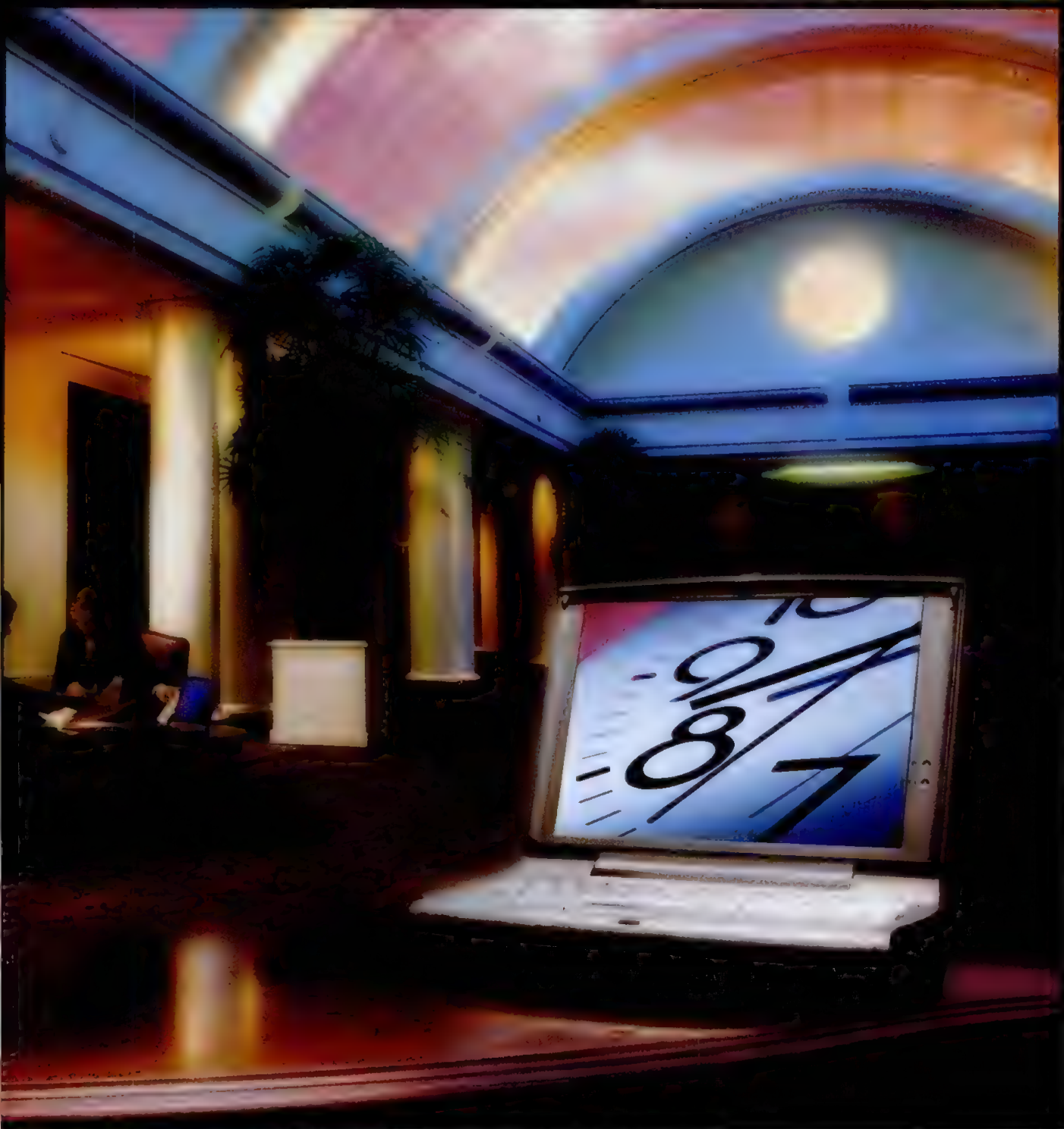
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Choose 067 at www.pcmag.com/infolink

either manually or automatically. Sending encrypted files via e-mail is easy, but the recipient must also have Your Eyes Only. Like the other security products reviewed here, it includes a secure screen saver.

In addition to securing files, Your Eyes Only can also protect your system by preventing Windows 95 from booting without a password. A full complement of administrative and auditing functions round out the package. If you forget your password, though, you'll need the Unlock disk to gain access. (Symantec Corp., 800-441-7234, www.symantec.com. Choose 503 at www.pcmag.com/infolink.)

- One highly focused product, **NovaStor-Authentex DataSafe** (\$50 street), is designed to protect individual files, not entire hard disks. Designed to be administered by an end user, it can be up and running in a matter of minutes. To protect files, you simply drag them onto DataSafe's safe or lockbox. The lockbox inside the safe provides maximum security: You could actually require that two people be present in order to access the file. But don't lose your keys, because there is no back door.

Unlike the other products reviewed here, DataSafe creates self-decrypting e-mail files that will only decrypt if the recipient has the key. This makes it one of the most useful products available for securing e-mail. (Novastor-Authentex Software Corp., 888-667-8228, www.authentex.com. Choose 569 at www.pcmag.com/infolink.)

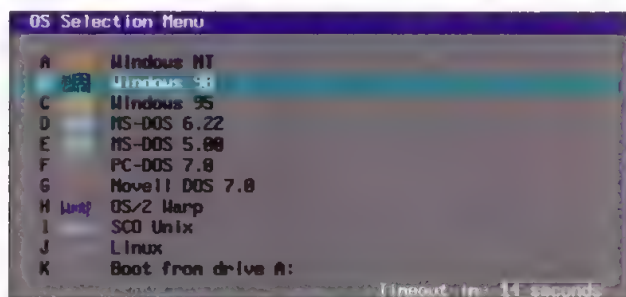
- **RSA SecurPC** (\$59 direct), from Security Dynamics Technologies, is the first general-purpose, 128-bit encryption product authorized by the U.S. government. And it does not require a trusted third party to hold the keys. File encryption is performed transparently when you move files into a specified folder, making it very easy to use. You can also create self-executing encrypted files using a shared password.

A well-designed passphrase control in the administration ensures that passwords meet stringent criteria. SecurPC also includes boot locking and screen locking. (Security Dynamics Technologies, 800-732-8743, www.securitydynamics.com. Choose 682 at www.pcmag.com/infolink.)

- Designed for corporations with portable systems in the field, **SafeGuard Easy** (\$70 street) couples a powerful installation rou-

tine with an easy-to-use interface. Designed to operate with a maximum of two hard disks, it can encrypt information at the partition level or at the disk level. It locks the computer prior to invoking the master boot record, and it also includes a locking screen saver.

The administration of SafeGuard Easy requires a knowledge of security systems. Once a system has been installed and checked out, the same file can be installed on all computers. If the user forgets the password, the system administrator can



SYSTEM COMMANDER is still the premier utility for managing multiple OSs. It also includes new features such as disk partitioning.

remotely unlock the system. (Utimate Safeware Systems Inc., 860-688-1199, www.ultimate.com. Choose 683 at www.pcmag.com/infolink.)

- WinMagic's **SecureDoc** (\$99 direct for the Windows 95 version) will satisfy even the most paranoid user. Its installation is more complex than that of the other products, requiring an empty logical disk (the product includes a copy of PowerQuest's PartitionMagic for creating partitions). To ensure airtight security, WinMagic recommends that you place encrypted versions of temporary and swap files on the partition.

For authentication, SecureDoc creates a key file, which can be located on your hard disk or a floppy disk. Once the system is installed, you only need to enter your password. (WinMagic, 888-879-5879, www.winmagic.com. Choose 684 at www.pcmag.com/infolink.)

MULTIBOOT UTILITIES

All reviews by David Haskin

- Disk-partitioning tools have long included multiboot utilities. Now the leader of the multiboot category, **System Commander Deluxe** (\$70 street), has turned the tables and added partitioning capabilities. System Commander can add or delete FAT32, NTFS, HPFS, and most Unix partitions, and modify FAT16 and FAT32 partitions.

System Commander's primary strength, however, remains its ability to boot to multiple operating systems on a single PC. Every time you boot up, System Commander examines your system. Even if you have only one operating system installed, its start-up menu provides at least two options: booting your OS and booting from a floppy disk. System Commander is already Windows 98-compatible, making it an excellent choice for experimenting with the new operating system before switching.

System Commander's new OS Wizard asks which OS you're adding and then examines your system to make sure you have sufficient bootable partitions and disk space to support it. The wizard will automatically make any changes to your hard disk, if necessary. You can also accomplish this manually using System Commander's partitioning utility.

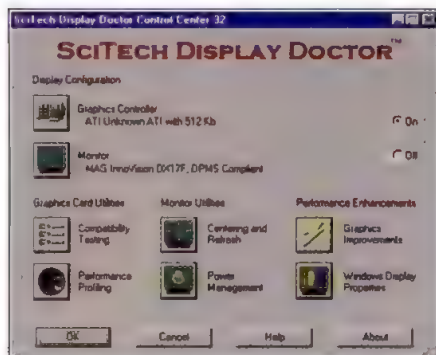
System Commander also provides extensive security and customization capabilities, ranging from the ability to change screen colors to checking for viruses in the master boot record. A new uninstall option for System Commander itself is a welcome addition. Still missing, however, is the ability to administer the boot menu from Windows. System Commander Deluxe remains the clear choice for safely running multiple operating systems on a single system. (V Communications, 408-965-4000, www.v-com.com. Choose 685 at www.pcmag.com/infolink.)

- A more recent addition to the multiboot category, Alpha Software Corp.'s **System Selector** (\$40 street), can't match System Commander for either power or ease of use. It does not include a utility for creating or modifying partitions. Nor does it have a tool like System Commander's OS Wizard to help you add new OSs.

System Selector does not automatically create a menu listing all installed operating systems. Instead, you must manually add each OS to the menu the first time you use the program. Perhaps the most serious problem is that System Selector makes it too easy to add nonbootable partitions to your start-up menu. System Commander circumvents this potential hazard. (Alpha Software Corp., 781-229-2924, www.alphasoftware.com. Choose 507 at www.pcmag.com/infolink.) **PC**

DISPLAY UTILITIES

• SciTech Software's **Display Doctor** (\$44.95 direct) is an add-on graphics card utility that brings older cards up to current VESA standards and provides



DISPLAY DOCTOR lets you customize graphics features and run performance tests.

bug fixes and enhancements for many newer boards. The utility gets DOS-based games up and running on just about any system, provides modest performance improvements, and adds power management and monitor refresh rate utilities to your graphics card's utility arsenal.

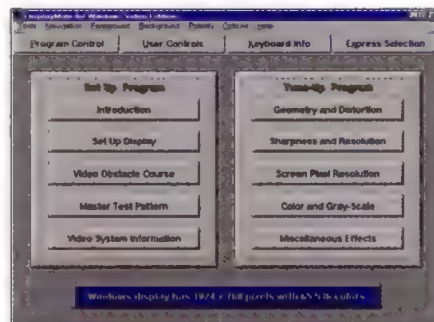
SciTech claims support for the latest chips on the market, as well as the ones long forgotten, but we found the software useful primarily as a VESA BIOS upgrade for older chips. For example, in a 90-MHz Pentium-based PC with an S3 Trio64-based graphics card, Display Doctor added a significant number of DOS-based graphics modes, fixed a bug that had prevented DOS-based games from running properly, and upgraded the card's VESA BIOS extensions. On a newer test system, however (a 200-MHz Pentium PC with an ATI Rage Pro-based graphics card), Display Doctor misidentified the graphics chip, calling it an unknown ATI with 512K, and disabled the card's linear frame buffer. It also reduced the reported graphics modes supported from 37 to 0.

Still, DOS-based gamers will appreciate Display Doctor's VBE 3.0 and VBE/AF 2.0 Accelerator Functions support, and owners of bare-bones graphics cards may find the utility's refresh rate and monitor-centering features appealing. (SciTech Software Inc., Chico, CA; 800-486-4823; www.scitechsoft.com. Choose 533 at www.pcmag.com/infolink.)—Jon Hill

• These days, mainstream computer users have become more savvy about how they set up and maintain their PCs for best performance and reliability. Yet when it comes to the monitor, most users still just plug it in, twiddle with the brightness and contrast, and forget about it after that. Enter **DisplayMate for Windows, Version 1.21** (\$79 direct), from Sonera Technologies—a handy utility that can quickly help you get the most from your monitor.

DisplayMate serves a number of useful purposes. It can, for example, help you optimize your display using a series of test patterns. Just adjust the brightness so that the black levels are correct, then set the contrast so you can view subtle shades of gray. It also provides test screens to help you use any special controls your monitor may offer, including screen geometry (such as trapezoidal and pincushioning adjustments), color adjustment, and convergence settings. You can also use the test patterns to evaluate specific CRT and LCD monitors to check for such flaws as poor convergence, uneven focus, and stuck pixels. (Sample patterns are available for download from the company's excellent Web site.)

For advanced users and MIS professionals, the company will soon offer DisplayMate Multimedia Edition, which will include video bandwidth tests, as well as a scripting language that can automate testing and setup procedures. For mainstream users, however, DisplayMate for Windows is more than adequate to let you get the most from your monitor. (Sonera Technologies, Rumson, NJ;



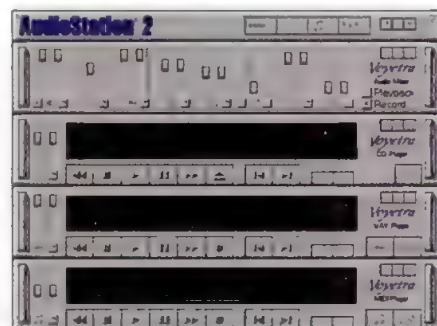
THE HOST OF DISPLAYMATE TEST PATTERNS help you check and optimize your monitor's settings.

800-932-6323, 732-747-6886; www.displaymate.com. Choose 534 at www.pcmag.com/infolink.)—Alfred Poor

SOUND AND STORAGE UTILITIES

• It wasn't too long ago that every multimedia PC included a sound card, and nearly every sound card shipped with a suite of sound utilities and a media-rack interface designed to look like a stack of home-stereo components. Today's motherboards, however, often incorporate their own sound hardware, giving rise to a new generation of multimedia machines that lack sound boards and, sometimes, the software goodies that accompany them.

Many users of such machines are satisfied with the basic multimedia tools that ship with Windows. But others long for the traditional media-rack interface.



VOYETRA'S AUDIOSTATION 2 uses a home-stereo metaphor to access multimedia functions.

Voyetra Technologies has tried to address this need by offering its popular front-end **AudioStation 2** (\$30 street) as a standalone package.

AudioStation 2 boasts a friendly stacked-rack design that combines a mixer and CD player with modules that play and record MIDI and .WAV files. It's designed to work with any sound hardware compatible with the Windows Sound System standard, and it interfaces seamlessly with the Windows 95 mixer/volume utility. It also includes entry-level MIDI-orchestrator and sound-editing applications, as well as an online MIDI reference manual and a set of user guides. Rounding out the bundle are a variety of animated and video tutorials; a library of over 50 .WAV, MIDI, and video files; and Voyetra's diagnostic utility MediaCheck, which lets you test and configure your system's sound hardware and drivers.

If you want something a little more flexible and appealing than the standard Windows Media Player, AudioStation is worth considering. (Voyetra Technolo-

gies Inc., Yonkers, NY; 800-233-9377, 914-966-0600; www.voyetra.com. Choose 538 at www.pcmag.com/infolink.)—Don Labriola

• For those who need to conserve space on your ever-taxed hard disk, Alpha Software Corp.'s **Gimme Space** (\$39.95

direct) and Synchronys SoftCorp's **BigDisk** (\$40 street) might be worth a look. Both make your hard disk seem bigger than it really is by relocating nonessential files onto a secondary disk (such as an Iomega Jaz Drive or SyQuest SyJet)—fooling Windows Explorer into thinking the data

is still on your C: drive. Although the two products are equally proficient, Gimme Space has the edge, thanks to its cleaner and more flexible interface.

The programs are for Windows 95 only and can use an internal, networked, or removable disk as the target. Both

Printer UTILITIES

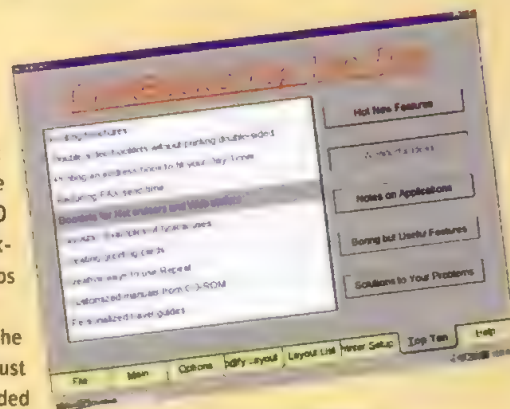
➔ These two handy utilities will give you great-looking printed output, whether you're surfing the Net or creating projects for home, school, or office.

ClickBook ▶

If you need to create booklets and other specialty printouts but don't want to learn (or buy) a full-blown desktop publishing package, Blue Squirrel's ClickBook (\$49.95 list) is worth a look. Ideal for SOHO and personal users, small businesses, churches, and schools, ClickBook is successful both for the variety of publishing projects it helps you create and for the clear, no-nonsense way it is organized.

Simply work in the applications you're used to. When you hit the print button, ClickBook's intuitive menus pop up, letting you adjust the output layout and features. Step-by-step explanations are included for printing such projects as single- and double-sided booklets, personal organizer pages, greeting cards, CD jewel-case booklets, travel guides, manuals, business cards, brochures, and mailing labels.

A quick and easy way to add publishing power to your existing applications, ClickBook is a must-have for small publishing jobs. (Blue Squirrel, a division of ForeFront Group Inc., Draper, UT; 800-403-0925, 801-523-1063; www.bluesquirrel.com. Choose 536 at www.pcmag.com/infolink.)

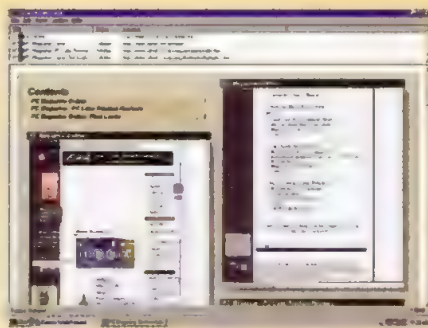


CLICKBOOK makes it easy to produce a range of great-looking documents without learning a DTP package.

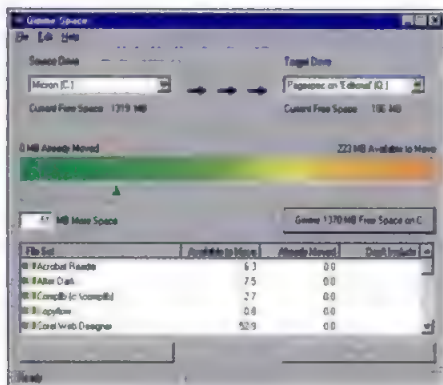
WebRecord for Windows 95 ▶

WebRecord for Windows 95, Version 1.0 (\$30 street), is available as a standalone utility or as a part of Canon Creative for Windows 95, Version 3.0 (a \$50 suite of printer applications). The program works with your Web browser to help you organize and print content from sites you visit. As you surf, WebRecord keeps track of all the pages you've seen. When you're finished, simply review the list and indicate which pages you want printed and in what order. The program also automatically generates a table of contents, with Web site hierarchies displayed in outline style and links footnoted at the bottom.

Refreshingly straightforward and easy to use and configure, WebRecord is a valuable tool for capturing and printing Web content. (Canon Computer Systems Inc., Costa Mesa, CA; 800-552-2666; www.ccsi.canon.com. Choose 535 at www.pcmag.com/infolink.)—Bruce Brown



WHERE WAS I? WebRecord tracks the pages you see as you surf and lets you print only those you want when you're finished.



GIMME SPACE sports an intuitive one-step interface that shows the source and destination drives, the megabytes moved, and the relocated files.

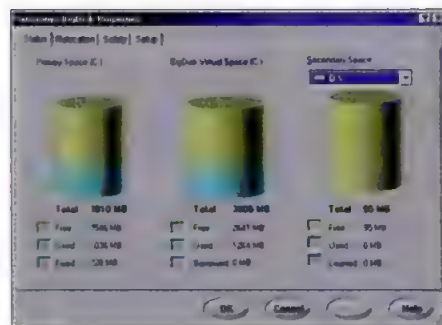
can detect all major applications on the source drive, determine an optimal amount of data to relocate, and prevent you from damaging any key system resources. Each product also allows you to change the amount of data to move, track the progress of transfers, and restore files via a simple, one-step procedure. No matter which product you use, you'll always get prompted when an application you're running suddenly

needs information from the target disk.

Differences between the two are small but noticeable. Gimme Space is a bit more intuitive, thanks to its all-in-one menu screen. From the Show File Sets menu, you can see which applications Gimme Space has detected on the source and how much data it wants to transfer from each application. A color-shaded bar shows the entire movable capacity of your source disk; its green-to-orange coloration warns you when you're trying to move a larger amount of data than recommended.

BigDisk, by contrast, serves as an appendage to Windows Explorer. The disk capacity graphs are in a separate Properties applet, and unlike Gimme Space, it doesn't indicate when your transfer size is entering risky territory. In addition, you have to fish through Explorer to restore transferred files. Still, it certainly succeeds in its main task of simplifying file management in PCs with more than one hard disk.

Although both programs will certainly perform their assigned tasks, Gimme



BIGDISK is a little less intuitive, making you split your time between Windows Explorer and its own Properties box.

Space is easier to use, because it keeps all the menus in one place and provides more detail about your transfers. If you want to use your removable disk to extend the useful life of your hard disk, take a look. (Alpha Software Corp., a subsidiary of SoftQuad Intl. Inc., Burlington, MA; 800-451-1018; www.alphasoftware.com. Choose 539 at www.pcmag.com/infolink. Synchronys SoftCorp, Culver City, CA; 310-842-9203; www.synchronys.com. Choose 540 at www.pcmag.com/infolink.)—Josh Levy **PC**



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Computer Shopper, December 1997

"Precision", "Finalist", Corel® \$3,000,000 World Design Contest. Artist, Huan Le Tran.



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INTERNET DESKTOP SECURITY UTILITIES

DEFEND against invaders

Surfing the Web might give dangerous programs access to your PC. These security suites will protect your system and ease your mind. By Neil Randall

If you connect to the Internet regularly, no doubt you're concerned about gaping security holes and devastating new viruses. Many of these are caused by executable code downloaded to your system without your consent or knowledge when you connect to a Web site. Sometimes referred to as "Trojan

horses" or "vandals," such items of code often take the form of ActiveX controls, Java applets, or viruses.

Vandals have reportedly been used to transfer money through Intuit's program Quicken to unauthorized German bank accounts. But even if you find such tales too fantastic to fret over, consider this: ActiveX controls needn't be overtly malicious to wreak havoc with your system. A seemingly innocent control could reshuffle your Registry, delete a critical system file, or disseminate a harmful virus. Adding to the danger is the presence of cookies, the small text files that shuttle bits of personal information between your computer and the Web sites you visit. There's no way to know who has your data, and there's no guarantee it won't be used against you.

The good news is that such threats can be neutralized. A variety of security suites and cookie managers are available to protect your system and your privacy. For

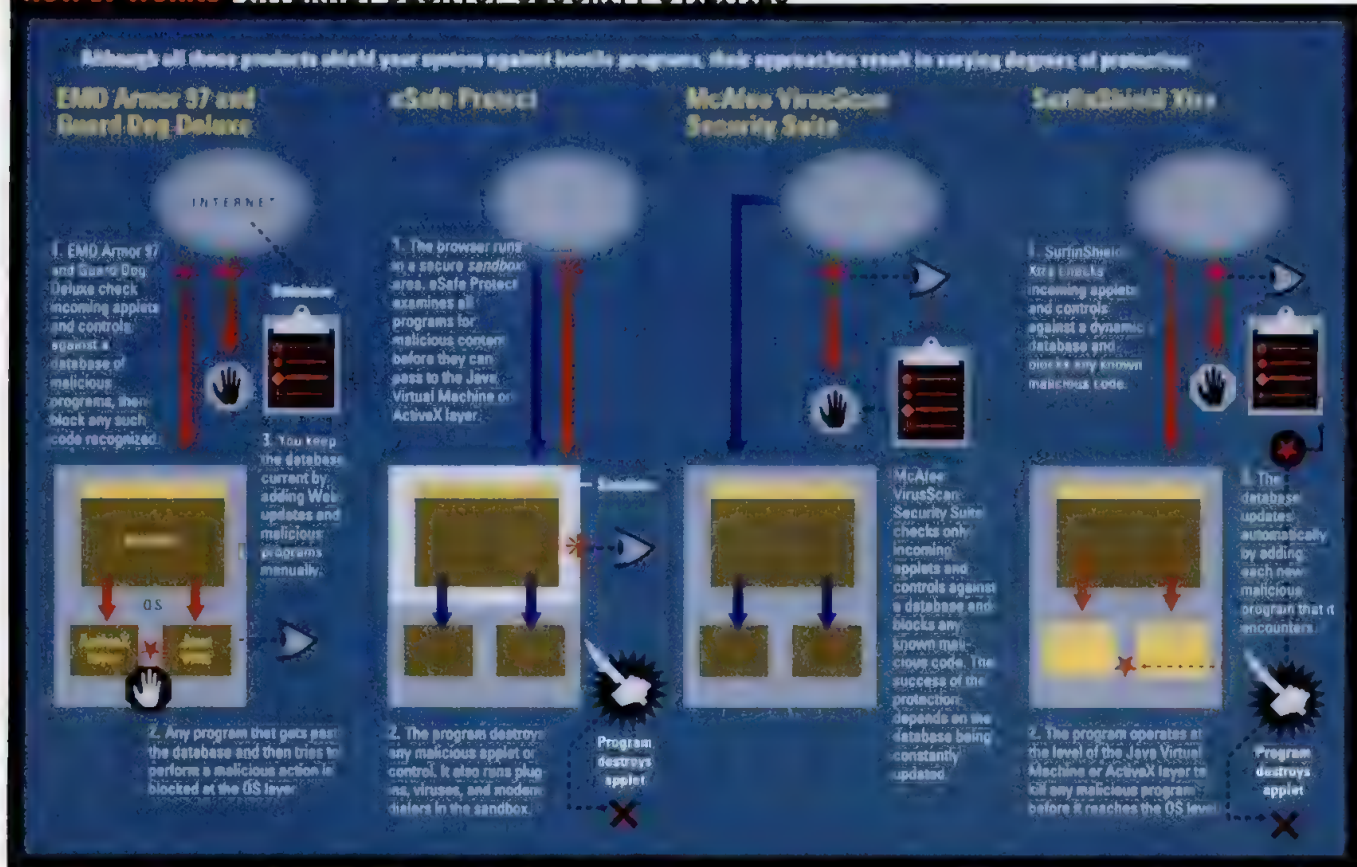
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HOW IT WORKS INTERNET DESKTOP SECURITY UTILITIES



this roundup, we tested the five commercially available security suites as well as a dozen cookie-manager utilities.

Though they all do a good job, each security suite takes a slightly different approach to protection. McAfee VirusScan Security Suite uses an updatable database to store a listing of questionable sites' URLs and programs proven to contain damaging applets and controls. EMD Armor 97 and Guard Dog Deluxe also use the database method but add an extra layer of protection by also monitoring browser activity. They alert you each time an applet or ActiveX control is about to be downloaded to your system.

SurfinShield Xtra takes a unique approach by isolating Java applets at the Java Virtual Machine level and ActiveX controls at the kernel level. Then it lets you decide whether to delete each item or let it function outside the quarantined area. Our Editors' Choice, eSafe Protect, uses a combination of browser monitoring and kernel activity monitoring. But unlike the other products, it then isolates the item and forces it to run from a protected area on the hard disk.

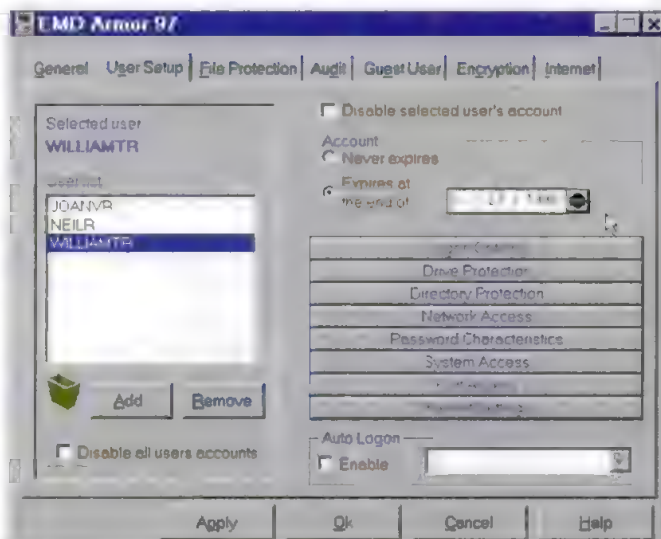
EMD ENTERPRISES

EMD Armor 97

A valuable profiling capability sets EMD Armor 97 3.0 (\$79 list) apart from its competitors. It offers good protection from ActiveX controls and Java applets, and includes an outstanding encryption utility. We found its antivirus utility too rudimentary to provide adequate protection, however, which makes the package insufficient as a total protection solution.

User profiles are the heart of EMD Armor 97. The utility works smoothly and is especially good for SOHO environments where Windows 95's System Policy Editor may be too complex. Each user is granted a user name and password and can log on from within

Windows 95 or at boot time. You can establish Windows NT-like characteristics for passwords and log-on options. You can restrict permissions for entire disk drives as well as for specific directories, and you can even establish a guest account with restricted settings. Although there is no facility for restricting an application by



EMD ARMOR 97 provides profiles that can specify complex rights and limitations for each user.

individual user, a workaround is to deny the user access to the directory where its executable file resides.

Armor also lets you set permissions expressly for Internet access. You can restrict users from all Internet access, permit full access, or grant access based on established ratings systems such as those from Safe Surf and the RSACI (Recreational Software Advisory Council on the Internet), as well as EMD's own CyberHood Watch system. You can also rate sites yourself or consult Armor's Content Guardian, which attempts to "read" pages during downloads to determine whether they meet access criteria you define. These criteria can screen for obscene language, nudity, sex, violence, gambling content, and even gaming sites—something new to us. Although we find the concept of the Content Guardian promising, the screening used was weak, letting us load several adult sites. For a roundup of Web site content-filtering utilities, see "Monitor a Child's Access" in this issue.

Armor's encryption component is the best we've seen among security suites. It lets you encode entire directories and encrypts and decrypts on the fly, resulting in faster load times than with individual encrypted files. The only drawback is that you must establish empty directories and then add programs and files; we would have preferred the ability to encrypt populated directories. (For a roundup of encryption utilities, see "Secure E-Mail," September 9, 1997.)

EMD Armor 97 3.0. List price: \$79. Requires: 486-based PC or better, 8MB RAM, 5MB hard disk space, Microsoft Windows 95. EMD Enterprises, Shrewsbury, PA; 800-898-9363, 717-235-4423; www.emdent.com. Choose 542 at www.pcmag.com/infolink.

ESAFE TECHNOLOGIES INC.

eSafe Protect 1.1



eSafe Protect 1.1 (\$49 list) bills itself as "antivandal" software, defining *vandal* as any executable code that can be downloaded from the Internet. This includes viruses, Trojan horses, Java applets, ActiveX controls, modem dialers (which can dial long-distance numbers without your knowledge), and even plug-ins. While similar in scope to SurfinShield

EDITORS' Choice

→ Security suite: eSafe Protect 1.1

→ Cookie manager: IEClean 3.01, NSClean 3.32

Each of these suites carries strengths that make it worth a place on your desktop. Still, we found eSafe Protect 1.1 to be the suite that offers the most innovative protection solution; it

also boasts excellent resource-protection capabilities.

Most products either block ActiveX controls and Java applets from running on your system automatically or require you to decide whether a given download is potentially destructive. More sophisticated and useful is eSafe Protect's approach, which lets everything you download run on your system in an isolated "sandbox." From there, eSafe monitors the program, determines its intentions, and

prevents it from causing harm.

In addition to ActiveX controls and Java applets, eSafe handles Trojan horses, modem dialers, and plug-ins. And it has a comprehensive anti-virus module (reviewed in "Protect Your Files," in this issue).

Cookie managers also come with a range of capabilities. We found IEClean (and its Netscape version, NSClean) to offer the most complete and flexible approach for dealing with cookies. Its privacy features are more extensive than others, yet it still gives users lots of choices.

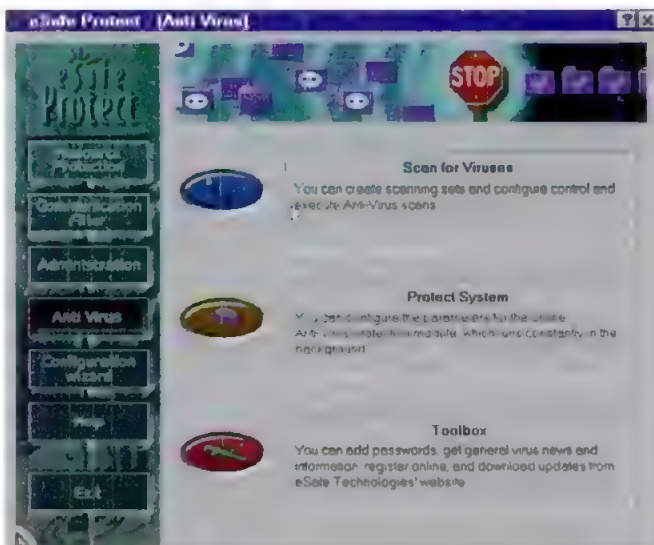
Xtra, eSafe provides superior virus protection, an excellent user interface, and the most innovative and comprehensive approach to protection we've seen. It earns our Editors' Choice.

The way eSafe monitors and controls Java applets and ActiveX controls is impressive. Rather than blocking a program or making you choose whether or not to let it into your system, eSafe lets the item enter but isolates it in a protected area on your hard disk called a sandbox. Then eSafe runs the program, monitoring its activity against a user-configurable protection "set." Or you can use the default set, which provides maximum protection.

Besides isolating and neutralizing potentially hostile items, eSafe lets you control access to files and directories. It keeps a list of untrust-

ed FTP and Web sites, based on eSafe's own research, and you can add to that list. The program will also monitor the TCP/IP stack to stop intrusion from IP addresses you define as suspect.

eSafe is controlled through excellent configuration dialogs. The Configuration Wizard gives you the option to delete browser caches and cookie files each time



THE CLEAN INTERFACE of eSafe Protect gives you access to tools for protecting your system from "vandals."

you boot. Although you can get eSafe to work with most browsers and e-mail clients, the software doesn't offer protection for users of Microsoft Internet Explorer 4.0, Outlook, or Outlook Express. The company expects to release a patch by the time you read this, however.

The Advanced Configuration dialog lets you establish settings for resource protection, communication filtering, virus protection, and program administration. The Resource Protection area lets you assign, read, write, execute, create, and delete permissions to any directory. Though this helps prevent applications from gaining access to specific directories, it's most useful when coupled with the User Administration module to create new user profiles with unique directory permissions.

The Communication Filter settings let you restrict Internet access by individual ports and by protocols such as HTTP, then establish the IP address range to which each filter applies. It lets you create a forbidden-word list, but there's no way to incorporate existing censor filters such as the RSACI filter.

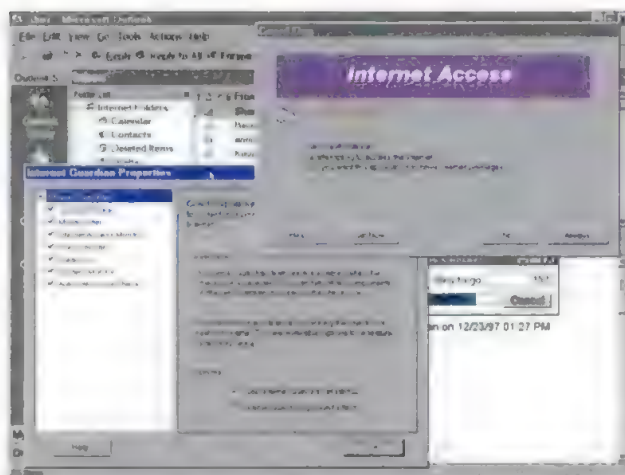
The antivirus module is so comprehensive that we've reviewed it as a standalone product in the antivirus utilities roundup elsewhere in this issue ("Protect Your Files").

eSafe Protect 1.1. List price: \$49. Requires: 486-based PC or better, 8MB RAM, 5MB hard disk space, Microsoft Windows 95. eSafe Technologies Inc., Seattle; 800-477-5177, 206-524-9159; www.esafe.com. Choose 543 at www.pcmag.com/infolink.

CYBERMEDIA INC.

Guard Dog Deluxe

Novices who may find these suites somewhat complex and intimidating will find an answer in Guard Dog Deluxe (\$59.95 list). The package protects you from downloading ActiveX controls, Java applets, cookies, and viruses. And while it doesn't run the programs in a protected area as eSafe does, an outstanding user



GUARD DOG DELUXE'S Internet Guardian gives you the power to assign Internet-access privileges by program.

interface makes Guard Dog the easiest suite to use of all those we tested.

The program installs easily and sits in the system tray when loaded. Everything is handled from a single Properties dialog, which yields different options for each item. We found Guard Dog easy to configure, and we appreciated the brief yet clear explanation that accompanies each item in the Options dialog.

Guard Dog's Internet protection capability stands out. The System Monitor provides unmatched usability for dealing with malicious applets and controls. Although other suites offer this protection, Guard Dog makes it easy to determine the precise level of protection and alerts you to any program that attempts suspicious activity.

The Automatic Virus module has a highly usable dialog—even better than that of McAfee VirusScan Security Suite—that allows you to schedule virus checks automatically for specific file types.

Guard Dog also offers an outstanding Cookie Blocker module that obviates the installation of a cookie manager. Similarly, the My-Info Filter prevents your browser from transferring information it gathered from one site to the next site that you visit, and a unique feature alerts you whenever one of your programs attempts to use the

TCP/IP protocol to connect to the Internet.

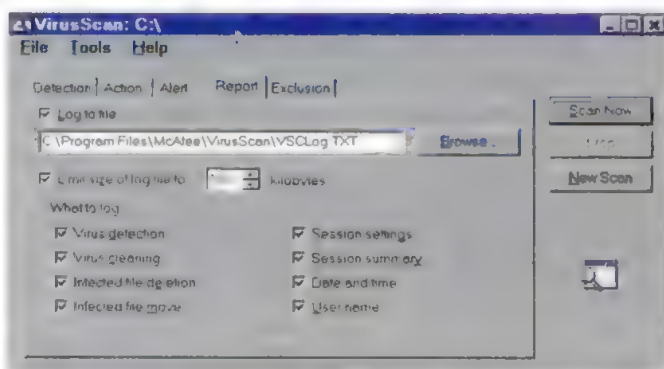
The Clean Up module covers your tracks by wiping clean your browser's cache, the listed of visited URLs, and the history file. This feature is missing from the other packages but is available in some of the cookie managers. And CyberMedia includes a limited version of its popular package Oil Change, configured to update Guard Dog only. Although this update feature did not run as smoothly as the one in McAfee VirusScan Security Suite, that package updates the antivirus module only. **Guard Dog Deluxe.** List price: \$59.95. Requires: 486-based PC or better, 8MB RAM, 6MB hard disk space, Microsoft Windows 95. CyberMedia Inc., Santa Monica, CA; 800-721-7824, 310-664-5000; www.cybermedia.com. Choose 544 at www.pcmag.com/infolink.

NETWORK ASSOCIATES INC.

McAfee VirusScan Security Suite 3.0

McAfee VirusScan Security Suite 3.0 (VSS) (\$99 list) includes a host of fine utilities, including the antivirus package VirusScan, which we review in our antivirus utilities roundup ("Protect Your Files"). Unfortunately, the "suite" is really a set of eight distinct modules lacking any hint of integration. And although the other products we saw block dangerous applets and controls based on their behavior, VSS relies on a database of malicious programs to identify and block them. This approach is less secure, because any applet or control that isn't in the database will get through.

The antivirus module offers excellent control through Windows 95 and DOS and performs boot-record, RAM, and system-file scans at start-up. The VirusScan Console applet lets you control



McAfee VirusScan Security Suite's VirusScan module provides excellent virus protection.

SUMMARY OF FEATURES

Security Suites

	EMD Armor 97 3.0	eSafe Protect 1.1	Guard Dog Deluxe	McAfee Virus-Scan Security Suite 3.0	SurfinShield Xtra 2.0
■ YES ■ NO					
List price	\$79.00	\$69.95	\$59.95	\$99.00	\$79.00
Virus protection	■	■	■	■	■
Hostile Java applet protection	■	■	■	■	■
Hostile ActiveX control protection	■	■	■	■	■
Plug-in protection	■	■	■	■	■
Push-item protection	■	■	■	■	■
Prevents access to system resources	■	■	■	■	■
Prevents access to local files	■	■	■	■	■
Prevents access to modems	■	■	■	■	■
Configurable security levels	■	■	■	■	■
Destroys hostile applets automatically	■	■	■	■	■
Restricts access to specific sites	■	■	■	■	■
Restricts incoming IP addresses	■	■	■	■	■
Blocks items from entering system	■	■	■	■	■
Uses secure sandbox to isolate items	■	■	■	■	■
Controls time usage on the Internet	■	■	■	■	■
Encrypts local files	■	■	■	■	■
Encrypts files sent over the Internet	■	■	■	■	■
Encrypts backup files	■	■	■	■	■
Encrypts e-mail files	■	■	■	■	■

when scans occur, and a unique Secure-Cast feature pushes new virus definitions to your desktop.

The WebScanX module includes the Download Scan feature, which checks for viruses during Internet downloads, letting you automatically delete infected files or move them to a separate directory. The E-mail Scan feature detects viruses in mail attachments and lets you automatically send an alert to the sender or to the entire network. PCFirewall lets you set rules for the types of connections you'll allow into and out of the network.

The WebScanX module offers protection against ActiveX and Java applications, viruses, and potentially dangerous e-mail attachments. It lets you filter on ActiveX or Java, maintain a list of questionable host names and IP addresses, and automatically send a network alert when it detects a malicious program. The database it uses to identify dangerous programs needs to be constantly updated, however, weakening the product's ability to protect your system from unknown intruders.

The package includes two cryptography modules. PCCrypto (for standalone machines) lets you add encryption through a simple drag-and-drop interface. Net-

Crypto (available only in the corporate version of VSS) lets administrators protect all data passing from the Internet to the local network. With file-by-file encryption, the cryptography features of VSS are easier to use than those found in EMD Armor 97.

VSS also includes utilities you won't find in other security suites. PC Medic provides crash protection, allowing you to save data and close programs. We found it didn't catch everything, though: We still managed to crash in Microsoft Outlook 97 and Netscape Communicator 4.0. PC Medic scans system performance, makes suggestions for optimal CD-ROM, video, and modem settings, and it provides access to a database of solutions for hardware and software problems. VSS also includes a full-featured backup utility with a scheduler, and for \$4.95 a month you can store data at the McAfee Personal Vault.

McAfee VirusScan Security Suite 3.0. List price: \$99. Requires: 486-based PC or

better, 8MB RAM, 35MB hard disk space, Microsoft Windows 95. Network Associates Inc., Santa Clara, CA; 408-998-3832; fax, 408-970-9727; www.networkassociates.com. Choose 545 at www.pcmag.com/infolink.

FINJAN SOFTWARE LTD.

SurfinShield Xtra

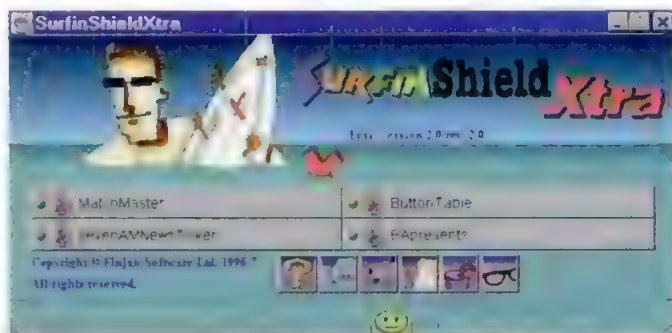
Although the user interface needs work, SurfinShield Xtra 2.0 (\$59.95 list) offers the most precise control over incoming ActiveX controls and Java applets we've seen. Average users, however, will find the program difficult, and because it lacks antivirus and encryption features, it is best used in conjunction with additional utilities.

Installation was troublesome. Though we encountered difficulties with all the browsers we used with SurfinShield, it was completely unable to locate and work with Internet Explorer, and support for IE4 was not available, although it may be by the time you read this.

The user interface is in need of an overhaul. The configuration dialog displayed truncated words when we set our monitor settings to large fonts and 1,024-by-768 resolution. In addition, we found that the dialogs render the suite suitable only for the most confident user or systems administrator. The main window offers unexplained choices, and the Security Weights dialog assumes you're already well versed in security terminology.

Despite these difficulties, SurfinShield Xtra provides a deeper level of protection against ActiveX controls and Java applets. Rather than blocking them at the browser level, it blocks them at the ActiveX and Java Virtual Machine levels.

SurfinShield uses two user-controlled security modules, XboX and Encapsulation. XboX stops specific ActiveX proce-



SURFINSHIELD XTRA'S CASUAL GRAPHICS belie the program's powerful protection against ActiveX controls.

COOKIE Managers



Cookies are small text files that your browser exchanges with a Web server. These invisible agents record information to make your Web experience more personalized, such as the password for a registered site, or your clothing sizes for an e-commerce store. But because cookies may track your activities on the Web in ways that violate your privacy, you may want to control the information they share. Your browser comes with some built-in cookie defenses. Microsoft Internet Explorer 3.0 and Netscape Navigator 3.0 let you reject cookies on an individual basis, and the latest versions of these products can block all cookies. You might also consider trying

one of the dozen cookie-manager utilities we tested. Products like Buzof only block cookies. Others such as Anti-Cookie and Cookie Cruncher will delete cookie files that already reside on your system. Programs such as Anonymous Cookie, Cookie Cruncher, and IEClean/NSClean let you examine cookie files and select which ones to keep, granting you greater control. Complete Cleanup, Cookie Web Kit, and IEClean/NSClean all include privacy features that clean browser caches and history files. The IEClean/NSClean package represents the most complete and flexible cookie solution, and it earns our Editors' Choice.

	Anonymous Cookie 1.0	Anti- Cookie 1.0	Buzof 1.4.1	Complete Cleanup	Cookie Cruncher 2.11	Cookie Crusher 1.6	Cookie Master 2	Cookie Pal 1.1b	Cookie- Server 1.0 (beta)	Cookie Web Kit	Crumbler97 Version 4	IEClean 3.01, NSClean 3.32
Street price	Free	\$10	\$15	\$30	Free	\$15	Free	\$15	Free	Free	\$10	\$40
Works with Microsoft Internet Explorer 3.x/4.x	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Works with Netscape Navigator 3.x/4.x	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Automatically deletes cookie files	■	■ (Navigator only)	■	■	■	■	■	■	■	■	■	■
Automatically rejects cookies	■	■ (IE only)	■	■	■	■	■	■	■	■	■	■
Prompts user for action	■	■	■	■	■	■	■	■	■	■	■	■
Sets guidelines for future action on individual sites	■	■	■	■	■	■	■	■	■	■	■	■
Lists cookies in current session	■	■	■	■	■	■	■	■	■	■	■	■
Views contents of cookie folder	■	■	■	■	■	■	■	■	■	■	■	■
Offers option to keep selected cookies	■	■	■	■	■	■	■	■	■	■	■	■
Launches browser	■	■	■	■	■	■	■	■	■	■	■	■
Opens and closes with browser	■	■	■	■	■	■	■	■	■	■	■	■
Handles history files	■	■	■	■	■	■	■	■	■	■	■	■
Handles visited links	■	■	■	■	■	■	■	■	■	■	■	■
Handles browser cache	■	■	■	■	■	■	■	■	■	■	■	■

dures from occurring based on user-defined rules, and Encapsulation checks whether each control is potentially damaging. If it's benign, Encapsulation will let it run; if it is malicious, the module will "kill" the item. To control Java applets, SurfinShield Xtra monitors beneath the Java Virtual Machine (JVM) level and invokes the JVM's own built-in security.

The Permissions dialog invokes a wide range of security settings, including the

ability to prevent e-mail, telnet, and Finger access to your machine, as well as attacks against Windows sockets that could result in the loss of system resources.

The Security Weights dialog lets you prevent suspicious applets from loading and either notifies you or kills any applet or control that violates a security setting, depending on your preference. You can assign a weight to a series of actions that may result in a security risk (the higher the weight, the greater the degree of prevention). Actions include reading, writing, and deleting files; replacing file properties; connecting to a network port; launching a local program; and loading DLLs.

The suite includes its own database of suspicious applets

and controls, which it keeps up to date dynamically by capturing information from all incoming controls and applets. The program helps you decide which ones are harmful by showing you how a given item would breach your predefined security criteria. Although modifying these criteria is complex, we found the default settings more than adequate.

SurfinShield can also give you detailed reports about the status of your system. Colorful graphs show which applets your browser is running, how much memory they're consuming, and the security exceptions that apply to them. You can control the individual applets and controls from the main window, including adding them to the database manually. **SurfinShield Xtra 2.0.** List price: \$59.95. Requires: 486-based PC or better, 10MB RAM, 17MB hard disk space, Microsoft Windows 95. Finjan Software Ltd., Santa Clara, CA; 408-727-8120; www.finjan.com. Choose 546 at www.pcmag.com/infolink. **PC**

Where to find them

Anonymous Cookie 1.0	www.luckman.com
Anti-Cookie 1.0	anticookie.home.ml.org
Buzof 1.4.1	www.basta.com
Complete Cleanup	members.aol.com/softdd/cookie/index.htm
Cookie Cruncher 2.11	home1.gte.net/dsavmoc/cookie.htm
Cookie Crusher 1.6	www.thelimitsoft.com
Cookie Master 2	www.barefootinc.com
Cookie Pal 1.1b	www.kburra.com/cpal.html
Cookie-Server 1.0 (beta)	www.newfangled.san-jose.ca.us
Cookie Web Kit	www.cookiecentral.com/files.htm
Crumbler97 Version 4	www.scsorp.com/personal/scottmac/crumbler.htm
IEClean 3.01, NSClean 3.32	www.nsclean.com

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INTERNET PARENTAL FILTERING UTILITIES

MONITOR a child's access

The Internet and the Web are marvelous resources. Keep your children's exploration of them safe with one of these utilities. By Kathryn Munro

Parents have never had it easy, striking a balance between giving children broad exposure to information and protecting them from inappropriate subject matter and other dangers. Achieving this balance in a world of cable TV, videos, and magazines was tough enough; then along came the Web.

Software that filters or monitors Internet activity or regulates computer usage helps with this balancing act. Here, we review the latest packages designed to help you ensure that accessing the Web from your PC is a safe venture for your child. None of these ten products can substitute for parental supervision, but the best of them help out when you can't be there.

Our tests involved trying to access extensive lists of URLs, words, and phras-

es while using each of the products. We tried to access well-known pornography sites as well as less obviously objectionable sites, some of which made no reference to sex.

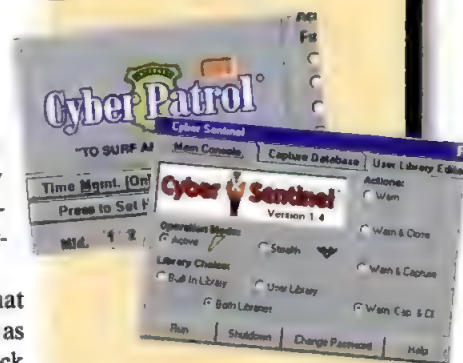
Our roundup includes products that range from multifunction packages such as Cyber Patrol and Net Nanny, which block and filter Web content and help limit your child's use of computer games, to single-purpose products such as SurfWatch and X-Stop, which block and filter Internet content only.

We also reviewed products such as Time's Up! and WatchDog, which do only time management.

Most filtering products use lists of URLs or match words, phrases, and patterns to block content. But the products vary in how they monitor:

Some use keyboard input, display output, or the local PC Winsock, others a proxy server, to filter based on their lists. Unfortunately, most products that use a

IN THIS REVIEW



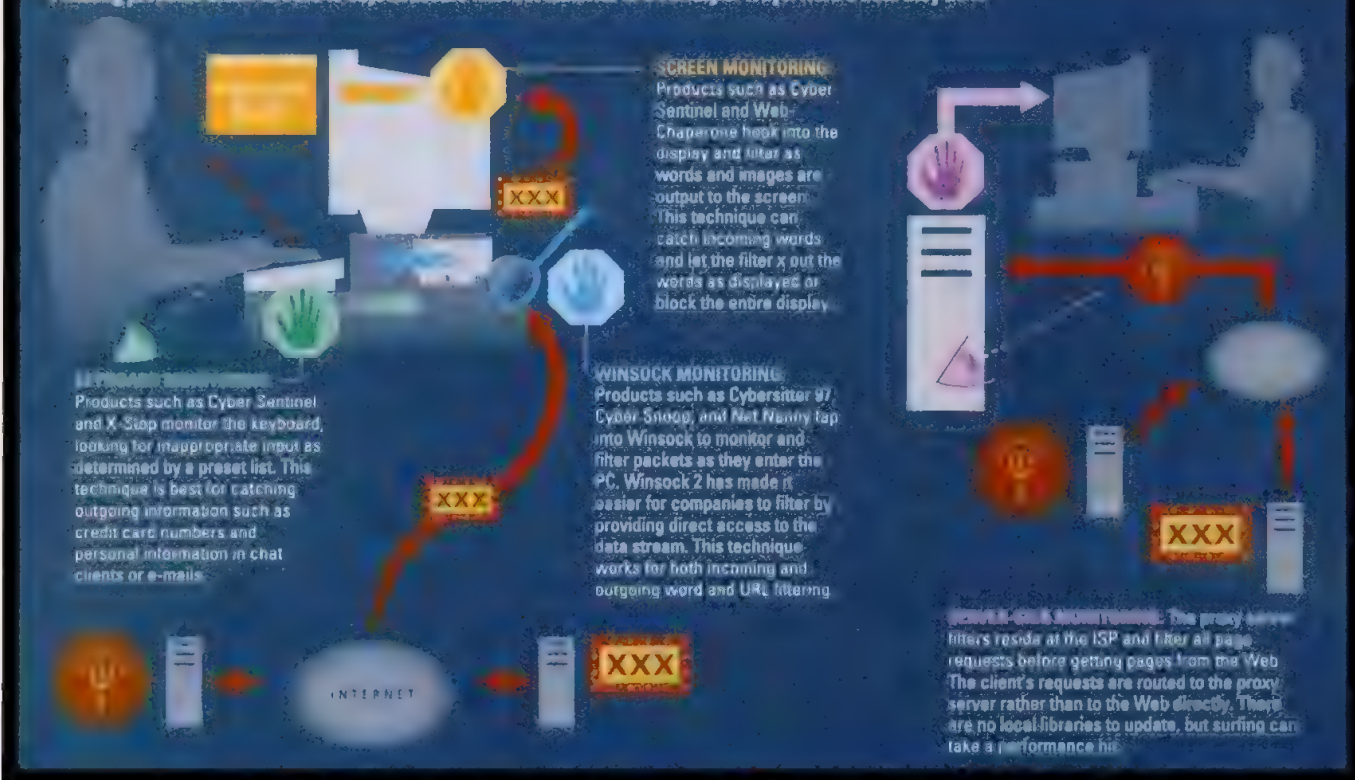
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HOW IT WORKS PARENTAL FILTERING SOFTWARE

Filtering products block access to objectionable Internet material in a variety of ways. Here's how they do it.



list-based approach do not allow you to view the list. Vendors are concerned that, by providing access to their lists, they will lose a primary competitive advantage or be seen as providing a road map to pornography on the Net. But most of the packages at least let you edit the lists—blocking and unblocking according to your own preferences.

Parents should be able to view and edit the lists of objectionable sites.

This ability is critical because none of the products have enough built-in intelligence to distinguish among obviously inappropriate sites, sites that are harmless

but have URLs that attract attention, and sites that exist to help with particular situations. (For example, some programs block

searches for *Super Bowl XXX*, and Cyber Sentinel blocked a review of itself that praised the product for how well it blocked pornography.) We found that only Cyber Snoop and Net Nanny permit

both list viewing and list editing.

In addition, some products, including Cyber Patrol and SurfWatch, use one or more third-party rating methods. The Recreational Software Advisory Council (RSAC) applies its computer-game rating system to the Internet, measuring each site for its level of violence, nudity, sex, and potentially offensive language. The World

Wide Web Consortium (W3C) also has a

protocol, a set of technical standards

called PICS (Platform for Internet Content Selection). Site

publishers label inappropriate Internet images

and Web sites with

HTML META tags.

A filtering program processes the tags at the user's computer, blocking the page if necessary.

Our testing confirms that

these packages principally block

sites with pornography, obscenity, and sexually explicit content—and they do a pretty good job. Still, parents should look

for the tool that gives them the most control over the sites their children can view.

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THE LEARNING COMPANY

Cyber Patrol

All reviews by Kathryn Munro

One of the most powerful products we looked at is Cyber Patrol 4.01, from The Learning Company. It successfully integrates control of online and off-line computer usage. Of the products that do not give you complete control over which sites get blocked, Cyber Patrol may be the best. It includes the ability to tailor settings for several users, but if you want complete control, Cyber Snoop is a better choice.

Cyber Patrol uses a list-based filtering system called CyberNOT for blocked sites and CyberYES for allowed sites. As with other list-based products (except Cyber Snoop and Net Nanny) you can't directly view the list. It's better categorized than any other product's list, and an excellent category definition gives a notion of what is being blocked by any particular filter. Sections include topics such as violence and profanity, partial nudity, full nudity, drug culture, sex education, and gambling. Parents can allow or block categories by selecting or deselecting them. To customize the lists, parents can add or delete

sites through the Site Control window. Since the actual lists aren't viewable, you must manage the lists blindly. The IRC keyword filters may also be applied to URL names, and your choices will then take precedence over the lists.

When a category such as sex education is set to *filter*, the program blocks access to sites by displaying a "Blocked by Cyber Patrol" page. By turning off the filter, we were able to find The Safer Sex Page and Planned Parenthood. Like all of the products, Cyber Patrol tends to err on the over-protective side. It continues to block sites such as the AIDS Awareness Hotline, even though sex education is not being filtered.

Not all of the categories are as aggressive about filtering as those pertaining to sex and obscenity. We found it relatively easy to access sites relating to bomb making. The gambling category was somewhat erratic as well. For example, the MGM Grand Hotel's home page was blocked, but the casino page within the MGM site was not.

In case you don't want to leave your child's Web page access to chance, you can use the CyberYES list, limiting your child's surfing to kid-friendly sites. This list is not viewable either but can be edited in the same fashion as the CyberNOT list.

You can configure Cyber Patrol individually for up to ten members of a

EDITORS' Choice

→ Cyber Snoop 2.07b

You want to expose your children to all of the wonderful resources of the Internet but still protect them from the adult content that's out there. The best product for giving you control over monitoring and

filtering your children's access is Cyber Snoop 2.07b, from Pearl Software, and so we award it our Editors' Choice.

Cyber Snoop is one of only two products that let you view the lists companies compile to block objectionable content. We found this feature essential for parents who want to decide exactly what their children can and cannot see. The products that do not let you view their lists are too restrictive in their blocking.

You also get an unparalleled logging feature with Cyber Snoop: It logs every Web site your child hits, tracks

the date and time, and gives you live links to each page request so you can readily check the sites. You can easily sort and search through the log.

We suggest two other products to consider for particular circumstances. For parents willing to relinquish some control over what kind of content is filtered to the software, Cyber Patrol 4.01, from The Learning Company, is a well-rounded package. If you're not concerned about filtering but wish to regulate your child's computer time, Time's Up! 1.10, from The Fresh Software Company, is an excellent choice.



log-on, you will automatically be strictly limited in usage.

The time management feature lets parents limit children's access to certain times of the day or by the number of hours per

day or week. Specific local applications such as games may be set with time limitations, or access may be totally denied. But features like Time's Up!'s vacation setting and the multiple security measures associated with Watch Dog make them better choices for users who merely want a time management tool.

The ChatGard feature is particularly useful. You can limit the kind of informa-

tion children are allowed to give out over the Internet, preventing them from giving out names, phone numbers, credit card numbers, and addresses. The information is x-ed out quickly (Net Nanny and X-

Stop perform this function also). Cyber Patrol worked well in filtering outgoing information in Java, HTML, and IRC chats but didn't x out incoming obscenities, as Cybersitter does.

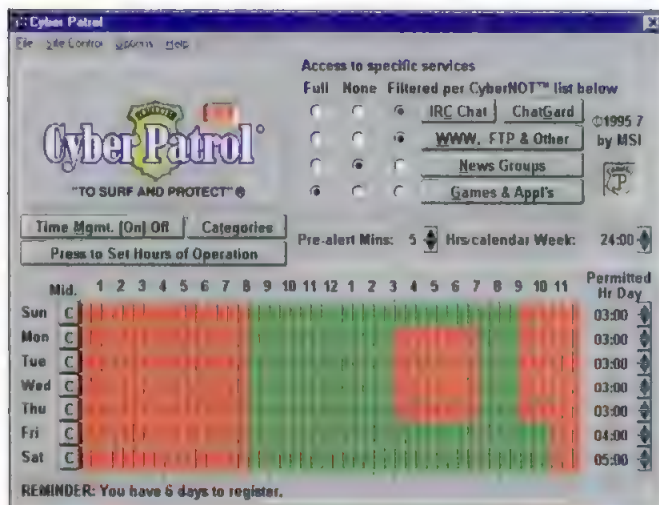
In exchange for relinquishing complete control over site-access lists, Cyber Patrol provides parents with one package to control all aspects of a family's computer usage.

Cyber Patrol 4.01. List price: \$29.95. Requires: 486-based PC or better; 8MB RAM; 800K hard disk space; Microsoft Windows 3.1, 95, or NT 3.5. The Learning Company, Cambridge, MA; 617-494-1200; www.learningco.com. Choose 550 at www.pcmag.com/infolink.

SECURITY SOFTWARE SYSTEMS INC.

Cyber Sentinel

The only program that can take screen captures of user activity, Cyber Sentinel 1.4 (\$49.95 list) runs quietly in the background, continuously monitoring computer usage both online and off-line. Although easy to install and set up, the program has many drawbacks, including a too-small database of screen captures. It also suffers from having a word library that you can't



CYBER PATROL lets you set time restrictions graphically, and you can easily set filter options with the click of a mouse.

household, including a visitor or a default user, unlike one-size-fits-all programs such as Cyber Sentinel, SurfWatch, and X-Stop. The default can be set at maximum protection, so that if you bypass the

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PM743A

view, a single-user configuration, and too many opportunities to subvert the intention of the program. Cyber Sentinel cannot compare with Cyber Patrol or Cybersitter in the area of customization.

Cyber Sentinel scans each screen using its Advanced Recognition Engine, blocking the screen if it contains sexually explicit or adult-oriented material or any of the words in your library. The feature presents significant problems, since the program will block even a review of itself if a statement such as *it blocks pornography* appears. Because it is not filtering specific URLs, which change frequently, regular updates are not required. The program can check Web browsers, search engines, chat rooms, e-mail programs, and word processors.

The built-in library of objectionable words, word fragments, and phrases is inaccessible to the user. You can configure your own library of words, numbers, and phrases to prevent access to sites, control searching, and keep addresses, phone numbers, credit card numbers, and PINs private. You can use your list in conjunction with Cyber Sentinel's list or in lieu of it. During testing, however, we found that although pages get blocked, a single mouse click clears the block for 10 seconds, long enough to send information out in a chat or an e-mail.

You can run Cyber Sentinel in either stealth or active mode. The stealth mode can be configured to give the user no indication that it is running nor any warnings when a violation is noted, quietly capturing the violation in a screen shot.

The active mode is considered a deterrent, as children will know the program is running because of the presence of the Cyber Sentinel icon in the system tray, just as with SurfWatch and X-Stop. Active mode may be configured simply to warn a child when a violation is detected, with a warning screen that blocks the entire page. It can capture up to 25 screens and can also close the program.

The captured screens are stored in a database that not only describes the vio-

lating program and gives the date and time of capture but also tells you the first violating phrase that triggered the capture. Our testing showed that the results don't always show the entire offense.

In addition, when the 25-screen limit is reached, Cyber Sentinel simply stops capturing, though it will continue to warn your child—thus leaving an incomplete

cations that Cyber Snoop is present are an optional warning at start-up and a listing on the Start menu.

Our tests found Cyber Snoop's monitoring and logging capabilities to be extremely strong. Cyber Snoop followed our surfing and newsgroup movements easily, recording the site address and the date and time of each hit.

Cyber Snoop did a good job of caching e-mail, news, and IRC chats. It had a problem with Java and HTML chats, logging them only as the HTTP pages they appeared on. Pearl promises a text capture feature in Version 3.0, expected by the time you read this.

With Cyber Snoop, you can remove duplicate hits and sort by Web sites and newsgroups. You can also sort by specific types of sites, using keywords. The program lets you export the log to a text file or to an HTML page (with full hyperlinks) and allow or block lists. Although the list management was comprehensive, performance improvements promised in Version 3.0 will be welcome.

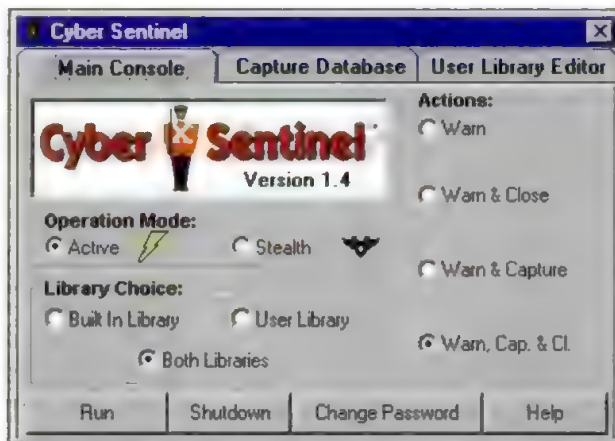
From the activity log, you can click on a URL (provided it's not on your blocked list) and go directly to it. For newsgroups, e-mail, and chats, Cyber Snoop keeps a cache of both incoming and outgoing traffic, which can be read from the URL list window. The cache's default setting is 5MB, but it is configurable.

For filtering, Cyber Snoop has Allow and Block lists that are empty on installation but are categorized into Web sites, FTP resources, e-mail addresses, newsgroups, and chat groups. Cyber Snoop will supply you on request with a starter list of more than 1,800 sites, which can be imported directly into the program and, as in Net Nanny, can be viewed and edited.

The Internet Security control can be set to allow varying levels of access. Each category can be set independently, and the default allows and monitors all sites.

When we imported a list of Web sites into the Block list, Cyber Snoop did its job well. It worked less well with newsgroups, returning listings of headers in an objectionable newsgroup but blanking out messages. If header content concerns you, you can block all access to newsgroups.

With the starter list and some parental diligence, Cyber Snoop is a strong tool for keeping your kids safe.



CYBER SENTINEL makes it easy to configure your monitoring options with its intuitive main console.

audit trail. Other monitoring programs, such as Cyber Snoop and Net Nanny, give you a much more complete activity log. **Cyber Sentinel 1.4.** List price: \$49.95; download, free for 30 days. Requires: 486-based PC or better, 4MB RAM, 20MB hard disk space, Microsoft Windows 3.1 or 95. Security Software Systems Inc., Sugar Grove, IL; 888-835-7278; www.securitysoft.com. Choose 551 at www.pcmag.com/infolink.

PEARL SOFTWARE

Cyber Snoop



The best tool available for giving you a view of your child's online travels, Cyber Snoop 2.07b, from Pearl Software, can monitor and log any Web, FTP, e-mail, chat, and newsgroup activity. Unlike Net Nanny, Cyber Snoop gives a detailed log of all activity that you can sort, edit, and export. You also get filtering capabilities, with a list that you can view and edit.

Cyber Snoop tracks Internet activity by looking at the content as it travels to and from your computer via the Winsock, giving you a more reliable way to monitor Internet data. This approach also lets Cyber Snoop run silently in the background. Once it's installed, the only indi-

Parental Filtering Utilities

Cyber Snoop 2.07b. List price: \$29.95. Requires: 486-based PC or better, 4MB RAM, 10MB hard disk space, Windows 95 or NT 3.51 or later. Pearl Software Inc., Chester Springs, PA; 800-732-7596; www.pearlsw.com. Choose 552 at www.pcmag.com/infolink.

SOLID OAK SOFTWARE

Cybersitter 97

Singled out within the past year by anti-censorship groups for going too far in its quest to keep children safe from pornography on the Internet, Cybersitter 97 has addressed the criticisms to a degree but still errs too much on the conservative side when filtering sites. Its strong site- and word-oriented filtering ranks it among the best in blocking objectionable sites, but it also blocked, among others, the entire domain of an Austin, Texas, ISP that contained a couple of X-rated sites. (By contrast, Net Nanny blocked just those sites.) Unlike other closed list-based programs such as Cyber Patrol and X-Stop—and true to this program's overly zealous approach—Cybersitter doesn't let you delete from its lists. Cybersitter is an easy-to-use stealth filter utility, but the inability to unblock restricted sites is a significant deterrent to recommendation.

Cybersitter works quietly at the Winsock level, monitoring and blocking inappropriate material as requests are made for Web sites, newsgroups, FTP sites, e-mail, and chat rooms. The only time you can tell that a filter is in operation occurs when an otherwise acceptable page has offensive words blanked out.

If a user queries a search site for objectionable material, the site simply returns nothing—no banners scolding the user or warnings of shutting down the connection. The removal of offensive words and URLs also occurs on pages of links.

Cybersitter offers several logging and blocking options. You can block access to offensive material using its categorized lists, and you can completely prohibit access to IRC, FTP, and newsgroups. Monitoring is done on all ports of the Winsock, so the product will catch violations on Java-based chat sites. Cybersitter lets you add ports to block or allow, so you can block ports that are not included in common protocols such as HTTP and IRC.

When logging Internet usage, you can

track all Web site visits or track only violations. The log file, which lists violations chronologically, can be deleted, printed, or saved for future viewing. But you can't do any sorting of the log, as you can with Cyber Snoop.

Cybersitter claims a list of thousands of objectionable sites (the list is updated weekly, and updates are free). But you can't view the list, as you can in Cyber Snoop and Net Nanny, nor can you delete blocked sites you want to view from the list.

You do have some measure of control over the lists, though. Cybersitter has subdivided its list into categories such as adult/sexually oriented, adult/violence, gay and lesbian activities, advocating hate and intolerance, and, in a nod to corporate customers, sports and leisure activities. You can turn the categories on and off. The categories are well defined but not as detailed as Cyber Patrol's.

Although Cybersitter's list of blocked sites is not customizable, you are not locked into it. New with this release is support for third-party filter files. Bundled with Cybersitter is Cybertimer, which can limit the time users spend online.

Cybersitter 97. Street price: \$40. Requires: 386-based PC or better, 8MB RAM, 1MB hard disk space, Microsoft Windows 95 or NT 4.0. Solid Oak Software Inc., Santa Barbara, CA; 800-388-2761, 805-967-9853; fax, 805-967-1614; www.cybersitter.com. Choose 553 at www.pcmag.com/infolink.

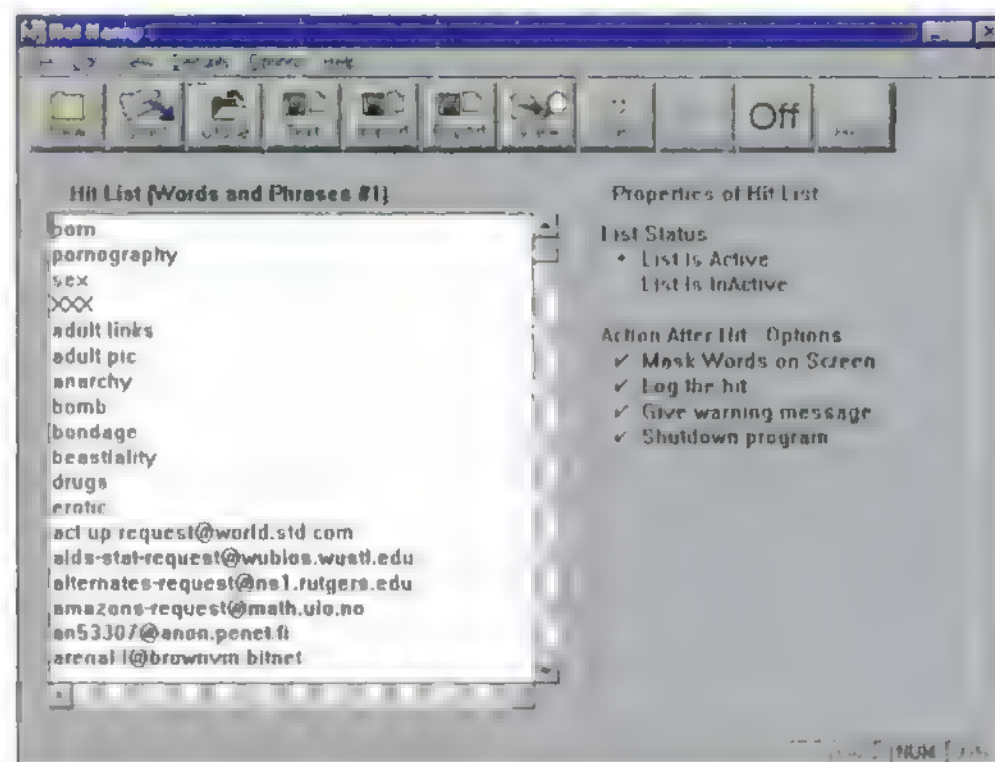
NET NANNY LTD.

Net Nanny

Besides Cyber Snoop, Net Nanny 3.1 is the only program that lets you view its restricted-site lists. Although the program provides extensive customization options, you have to make a significant effort to create a comprehensive list of restricted sites. Even though Net Nanny has a simple interface and a helpful user manual, some parents may find the customization process too daunting and time-consuming and opt for a product such as Cyber-

Patrol, Cybersitter, or X-Stop, which makes the choices for you.

Net Nanny includes easily edited starter lists of words, phrases, and sites. Other programs, such as X-Stop, let you edit their lists, but only if you accidentally find a site that they block. You can fortify Net Nanny's limited lists by downloading free lists from the Net Nanny Web site (updated every two weeks). At press time, the lists totaled more than 10,000 sites and words—which doesn't approach the levels claimed by such products as Cyber Patrol and X-Stop.



NET NANNY lets you create and view your restricted lists, as well as view the lists you get from the company.

You can also customize up to 12 lists of words, phrases, URLs, and personal information. These lists may be categorized as words and phrases, newsgroups, personal information, IRC chat, and Web sites.

When restricted words or numbers are typed into an application being screened, they are x-ed out (although not as quickly as X-Stop x-es out its restricted words). Net Nanny handles the task extremely well, even x-ing out its own manual's references to sex and pornography when you open it in Notepad.

Net Nanny lets you monitor IRC chats but currently doesn't allow you to monitor Java chats. When we received or sent e-mails with offensive words in the addresses or subject headers, the words were x-ed out. If the body of the text included any forbidden words, though, they were transmitted untouched. Net Nanny claims it will support message-body filtering in a future version.

Unlike such single-user products as Cyber Sentinel and X-Stop, Net Nanny

SUMMARY OF FEATURES

Parental Filtering Utilities



	Cyber Patrol 4.01	Cyber Sentinel 1.4	Cyber Snoop 2.07b	Cybersitter 97	Net Nanny 3.1	SurfWatch 3.0	Time's Up! 1.10
■ YES ■ NO							
List price	\$29.95	\$49.95	\$29.95	\$39.95	\$39.95	\$49.95	\$19.95
Configure for multiple users and groups	■				■		■
User can control monitoring via password	■	■	■	■	■	■	■
Provides allow/disallow list	■ ■	■ ■	■ ¹	■	■ ■	■	N/A
User can edit/view/import lists	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	N/A
List updates by subscription/free download	■	■	■	■	■	■	N/A
Logs online time/hits	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Filters on sex/hate/violence	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	N/A
Filters on illegal drugs/alcohol/gambling	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	N/A
Blocks individual words/Blanks or x-es words out	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	N/A
Restricts access to applications	■	■	■	■	■	■	■
Monitors online time/applications usage	■ ■	■	■	■	■ ■	■ ■	■ ■
Logs general computer usage	■	■	■	■	■	■	■
Warns/shuts down on detection of restricted words or URLs	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Prevents distribution of personal information	■	■	■	■	■	■	■
Supports ratings standards	■	■	■	■	■	■	■
Online help/Printed manual/Manual on-disk	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■

N/A—Not applicable. This product monitors usage but does not filter content. (1) Supplied on request. (2) User list only. (3) The user can only add to lists.

may be configured for multiple users, letting you give restart or override privileges appropriate to each user. Net Nanny provides a detailed audit trail of actions the user has taken online, applications used, the time and date the actions occurred, and the program's response, but doesn't list URLs in the log, as Cyber Snoop does.

Although some parents may not want to take the time or initiative to customize Net Nanny's lists, others will appreciate having the option of knowing just where their children can or can't go.

Net Nanny 3.1. List price: \$39.95. Requires: 486-based PC or better, 4MB hard disk space, 4MB RAM, Microsoft Windows 3.x or 95. Net Nanny Ltd., Vancouver, B.C., Canada; 800-340-7177, 604-662-8522; www.netnanny.com. Choose 554 at www.pcmag.com/infolink.

SURFWATCH SOFTWARE INC.

SurfWatch

SurfWatch was one of the original products in this market, and Version 3.0 (\$49.95 list) builds on three years of experience to emerge as a robust and effective filtering tool that is also one of the easiest to install and use. Strictly for online filtering, SurfWatch can block Web, FTP, Gopher, chat, and newsgroup access. The customization options now offered have made it an even simpler tool to work with. But if you're looking for more control and

fine tuning, then SurfWatch lags behind such products as Cyber Patrol and Cyber Snoop.

Relying on a list-based approach to blocking Web access, SurfWatch, though not as fine-grained as Cyber Patrol, uses categories such as sexually explicit, violence and hate speech, gambling, and illegal drugs and alcohol. SurfWatch, unlike Cyber Snoop and Net Nanny, doesn't let you view its lists, but you can customize them to a degree. The lists can be turned off entirely and added to, and you can delete specific sites when you find a blocked site that you want to access.

The customization feature lets you block sites at any point in its Directory Tree: You can block the whole domain, a

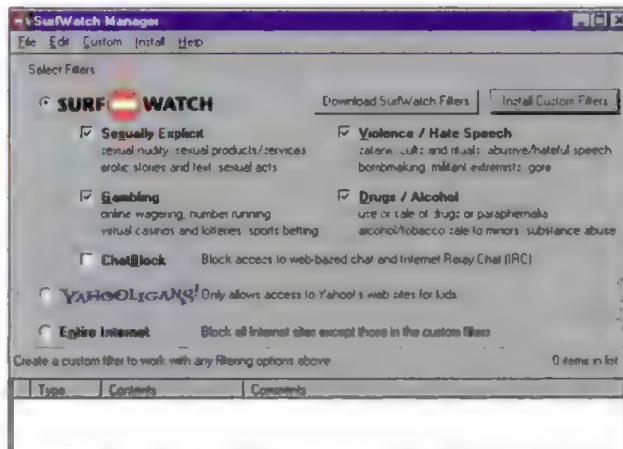
domain and a directory, or a single page. A domain can be defined as either the DNS name or the IP address. This feature can help prevent the overblocking of a domain or a site that has only some objectionable material.

SurfWatch also includes ChatBlock, a feature that denies access to any chat format (IRC, Java, or HTML). We found that ChatBlock worked well, and you can set your own ports as with Cybersitter, using a custom filter.

SurfWatch is enabled whenever you turn on your system. Only a small icon in the tool tray lets you know SurfWatch is there, just as in X-Stop.

You can turn SurfWatch off with a mouse click, once the correct password is entered. You can do this at any time, without restarting your machine or Windows. But any changes you make, such as alterations in list preferences, customizations, and new passwords, necessitate rebooting. To enhance security, the product now allows you to change your password periodically.

If you don't necessarily trust the SurfWatch lists, you can



SURFWATCH's filters are turned on and off easily.

WatchDog 1.2	WebChaperone 1.1.1	X-Stop 3.01
\$25.00	\$49.95	\$39.95
■	■	■
■	■	■
N/A	■	■ ■
N/A	■ ?	■ ■ ■
N/A	■ ■	■ ■
■ ■	■ ■	■ ■
N/A	■ ■ ■	■ ■ ■ ■
N/A	■ ■ ■	■ ■ ■ ■
N/A	■ ■ ■	■ ■ ■ ■
■	■	■
■	■	■
■	■	■
■ ■	■ ■	■ ■ ■
■	■	■
■ ■ ■	■ ■ ■	■ ■ ■

SurfWatch 3.0. List price: With one-year subscription, \$49.95. Requires: 386-based PC or better, 4MB RAM, 8MB hard disk space, Windows 95, Winsock-compatible Internet software. SurfWatch Software Inc., Los Altos, CA; 800-458-6600, 650-948-9505; www.surfwatch.com. *Choose 555 at www.pcmag.com/infolink.*

THE FRESH SOFTWARE COMPANY

A flexible and broad time management utility, Time's Up! 1.10, from The Fresh Software Company, lets parents set specific limits for their children's computer usage, deciding which applications are allowed and how long each may be used. You can easily view and print usage reports. If you're looking for a single-purpose utility for time management, Time's Up! is your answer: It's easier to set up and use than WatchDog and has more power than Cyber Patrol and Cybersitter 97.

to 90 days). The permanent settings automatically resume when the temporary time limit is reached.

Once user groups are set, you select which applications will be given time limits. You can group similar applications together, such as games or educational programs, so they share the same limits.

Time's Up! is designed to work primarily with Windows programs, but you can deny access to the DOS prompt. You can then schedule times when DOS becomes available, so that DOS programs can be used.

The final step in the setup process lets you set time limits and access levels for the user groups and program groups.

Time's Up! 1.10. List price: \$19.95. Requires: 5MB hard disk space, Windows 3.1 or Windows 95. The Fresh Software Company, Coral Gables, FL; 800-846-3787, 305-569-6422; www.timesup.com. *Choose 556 at www.pcmag.com/infolink.*

NIC JANSMA

If you set up a time management program on your system, you can bet that your kid will try to beat it. WatchDog 1.2 benefits from the ultimate insider's perspective: It's written by a 15-year-old developer. The program is not for neophytes, but computer-savvy parents looking to limit their children's computer time should give this highly configurable package a look.

WatchDog can be configured to designate multiple users as parents or nonparents. You can set usage times for all users, based on daily, weekly, monthly, or unlimited periods. When a time-out occurs, the program can be set to shut down, restart Windows, restart the computer, or show the WatchDog log-on (informing users of the time-out). A feature called GenMode (for *generosity*) gives you a little more time.

drives and disable password caching.

You can time yourself out and get locked out of the computer if you're not careful. Parents must make sure to keep their own time limits set at Unlimited, as there is no override feature.

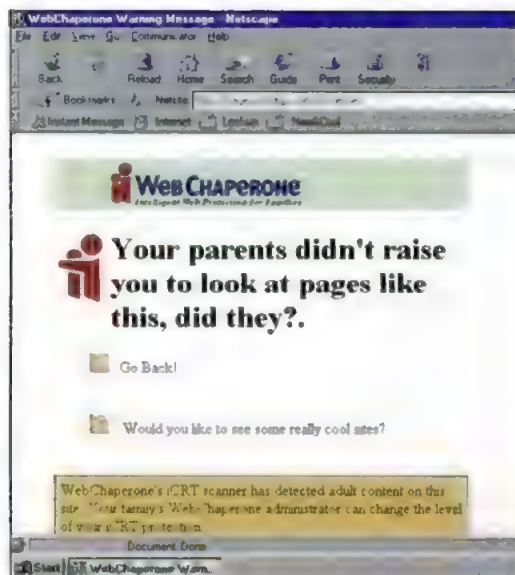
Just needing a little polish, this functional shareware program has enormous potential for users who want to limit their children's computer usage.

WatchDog 1.2. List price: \$25.00. Requires: 486/33-based PC or better, 8MB RAM, 2MB hard disk space, Microsoft Windows 95. Nic Jansma, Grand Rapids, MI; e-mail, djansma@vixa.voyager.net; www.sarna.net/watchdog. Choose 557 at www.pcmag.com/infolink.

WEBCO INTERNATIONAL INC.

Through an approach based on technology rather than lists, WebChaperone 1.1.1 does an excellent job of scanning requested Web pages for sexually explicit material and tracking and logging your family's Web surfing activity. It does not filter e-mail, chats, or local applications, though. We found the program to be a user-friendly tool that's effective for blocking pornography, although it doesn't give you full control over how you use the Web and is thus less effective than Cyber Snoop.

WebChaperone uses its iCRT (intelligent Content Recognition Technology) to scan each page request for pornography before the page is displayed. The software



WEBCHAPERONE delivers age-appropriate screen messages when you try to access objectionable sites.

THE 1998 UTILITY GUIDE

Parental Filtering Utilities

blocks any questionable page and shows an age-appropriate explanation on-screen. This package uses humor in its messages rather than the scolding screens used by X-Stop. It suggests alternative sites based on the user's age-group classification, and we found the recommendations to be clever and fun.

WebChaperone performed well on our tests, both in blocking and in allowing sites to be viewed on an appropriate age-related scale. For example, a site on safe sex might be blocked for a child but not a teen.

You don't have to worry about constantly updating lists with WebChaperone, as you do with Cyber Patrol, Surf-Watch, and X-Stop. You may add particular phrases and individual URLs that pertain to topics you don't want your child to access. If you find something blocked that you want to access, you can add the site to an *allow* list, as you can in list-based products such as Cyber Patrol. You can also adjust WebChaperone to respond to the PICS rating labels on some sites.

You can configure WebChaperone for each member of the household, including a default user, unlike such single-user products as Cyber Sentinel and Surf-Watch. Each person is assigned to an age group: adult, teenager, preteen, or child. You can set four different protection levels within each group: unprotected, minimum, medium, and maximum. *Unprotected* will let you access any Web page, whereas *maximum* blocks the user from reaching Web pages with adult content.

Each family member gets a password and is expected to log on to WebChaperone. The program is enabled at boot-up in the Default setting. Each individual user logs on by clicking on the tiny icon in the tool tray. Should users forget to log on, they simply remain at the default settings. An administrative password lets you make any changes in preferences or settings.

WebChaperone monitors user activity as well as filtering content. The PageMark History window provides you with a detailed record of each site viewed, telling you who went there, when, the rating, the URL, the last time the site was visited, and the first time it was accessed. A double click on the page icon next to the URL will open that page in your browser. If you deem the site inappropriate for a certain

family member, you can add the site to the prohibited list for that individual via a few simple clicks.

WebChaperone 1.1.1. List price: \$49.95. Requires: 486-based PC or better, 16MB RAM, 1.3MB hard disk space, Microsoft Windows 95. WebCo International Inc., Portland, OR; 800-387-8373, 503-417-2900; www.webchaperone.com. Choose 558 at www.pcmag.com/infolink.

LOG-ON DATA CORP.

X-Stop

Sharply focused on access prevention, X-Stop 3.01 (\$39.95 list) filters and blocks sites before they ever appear on your monitor. It provides a fairly robust filtering tool, tackling foul words entered into search engines or within any other application. But it does not let you view all its lists (as you can with

when you type the word into the library.

X-Stop immediately blocks objectionable words typed into e-mail, chats, and search engines, but the user can easily receive objectionable text—in a chat environment, for example.

The Search Engine Monitor uses proximity logic to block words and word combinations that could be used as keywords. On our tests, X-Stop was too aggressive in blocking specific words, but it also lapsed somewhat. For example, we were blocked from searching on *Super Bowl XXX* or *Dick Van Dyke*. But when we searched on *X-X-X*, X-Stop did return hits but blocked all URLs.

The Foul Word Filter almost immediately x-es out any objectionable word, ethnic or racial slur, or religious epithet that is typed into an application. The list

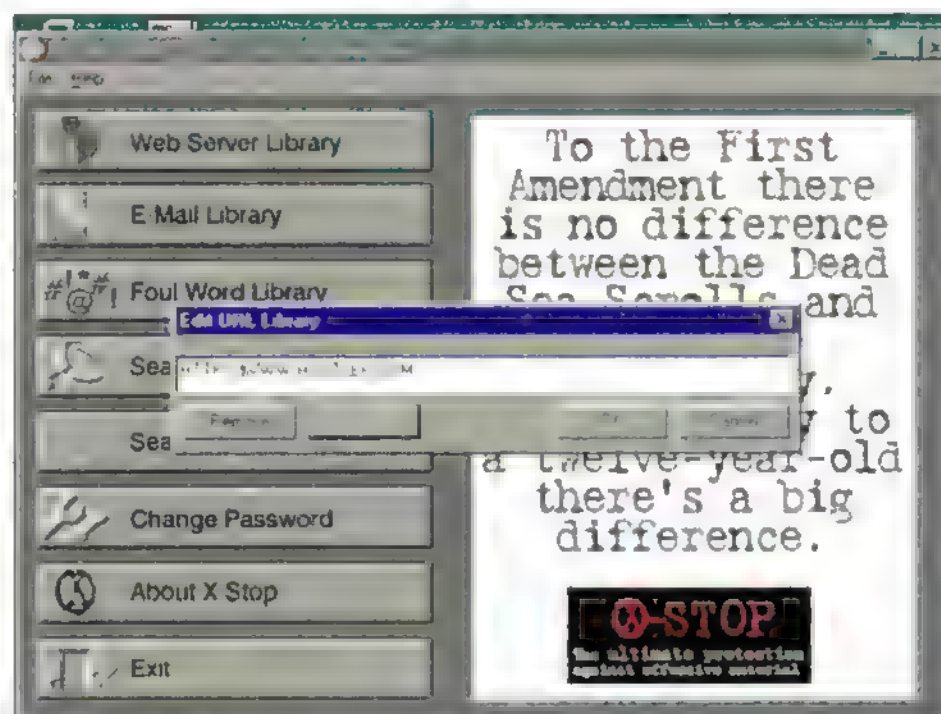
of applications affected includes pretty much any that take keyboard input, but you can't control which applications X-Stop monitors.

Using the Foul Word Filter with our e-mail application considerably slowed system performance. We found in a Java chat that outgoing foul words were blocked on our machine, but they were still sent through, followed by "****".

X-Stop claims to prohibit you from installing or

using file encryption programs such as uucode20.exe as a way to hide pornography. In our testing, however, we found that it blocked only specific encryption programs, and we were able to load and use several other shareware uencode/udecode utilities.

We found X-Stop to be one of the fastest programs for blocking words as they are typed. It has a simple user interface and strong libraries, but it's not as well-rounded a package as Cyber Patrol. **X-Stop 3.01.** List price: \$39.95. Requires: 386-based PC or better, 8MB RAM, 3MB hard disk space, DOS 3.3 or later or Microsoft Windows 3.1 or 95. Log-On Data Corp., Anaheim, CA; 888-786-7999, 714-577-4929; fax, 714-577-4932; www.xstop.com. Choose 559 at www.pcmag.com/infolink. **PC**



X-STOP reveals whether or not a site is on its restricted list when you try to add or remove a URL.

Cyber Snoop), it offers no logging features, and its word filters are actually better at preventing your kids from sending offensive material than receiving it.

X-Stop offers several measures of protection: the E-mail Typing Monitor, Internet Monitor (screening Web, FTP, and IRC), Search Engine Monitor, and Foul Word Filter. Its lists contain categories including hate groups, pyrotechnics and bomb making, child pornography, and bestiality, but this is still not as fine-tuned a set of lists as Cyber Patrol's.

Although you can't view the actual lists of URLs and words, as you can with Net Nanny, you can still add or delete words and URLs. You determine whether a word or URL is included on the list or not by checking whether the delete button or add button is enabled

11:00



11:06



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across a playground.

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INTERNET BROWSER ACCELERATORS

SPEED up browsing



The more browsing you do, the more help you need to speed up the process. These utilities help your research or surfing go faster. By Edward Mendelson

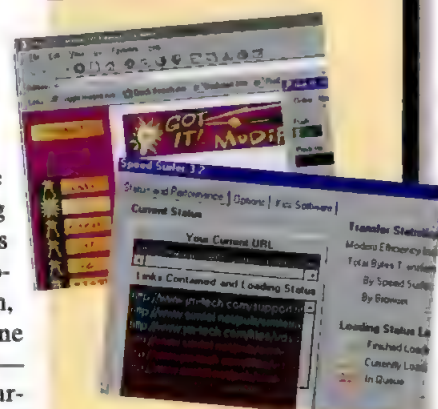
Even if you have a 56K or ISDN link to the Internet—or even a direct network connection—the Web still may not be fast enough for you; and if you have a 33.6-Kbps connection or one slower than that, it certainly won't be fast enough. Browser accelerators are utilities designed to make Web pages appear more quickly in your browser, using your existing connection to the Internet. Accelerators get the job done, but whether the extra level of complexity they add is worth the extra speed is something only you can decide.

Data from the Internet can't reach your computer any faster than your modem and telephone line (or your network connection) can send it, so most browser accelerators work by downloading remote pages to your hard disk *before* you try to view them. When you enter the address of the page you want, or click on a bookmark or link that leads to that page, the page loads instantly from your disk instead of at gla-

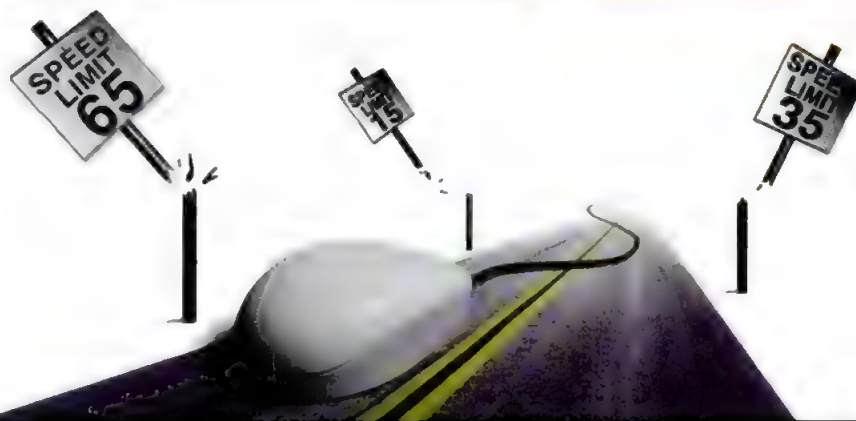
cial speed from the Internet.

Of course, if it were that simple, the cable modem guys would be selling pencils on street corners. The vendors of these products claim as much as 36-fold speed increases. In practice, though, the improvements realized by using one of these products are intermittent—sometimes noticeable but seldom startling. A browser accelerator can speed access to some but not all pages you want to visit. It can't improve the time required to load a page the first time you view it, but the more time you spend reading a page, the more time the accelerator has to *prefetch* all the pages linked to that page, so that they're already on your disk when you click on a link. If you quickly

IN THIS REVIEW



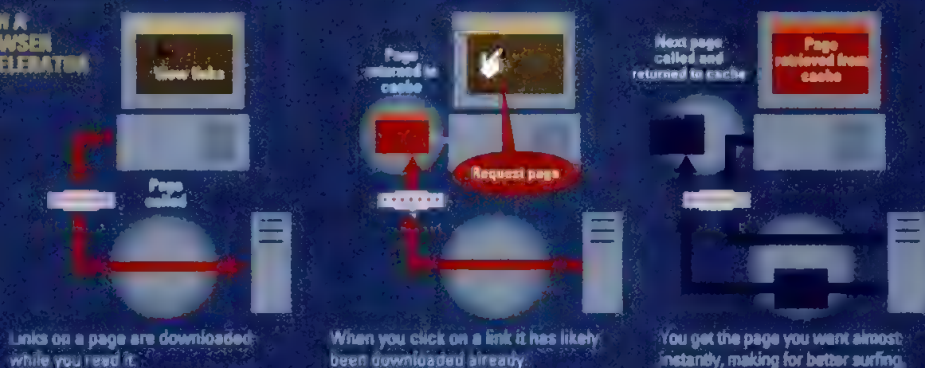
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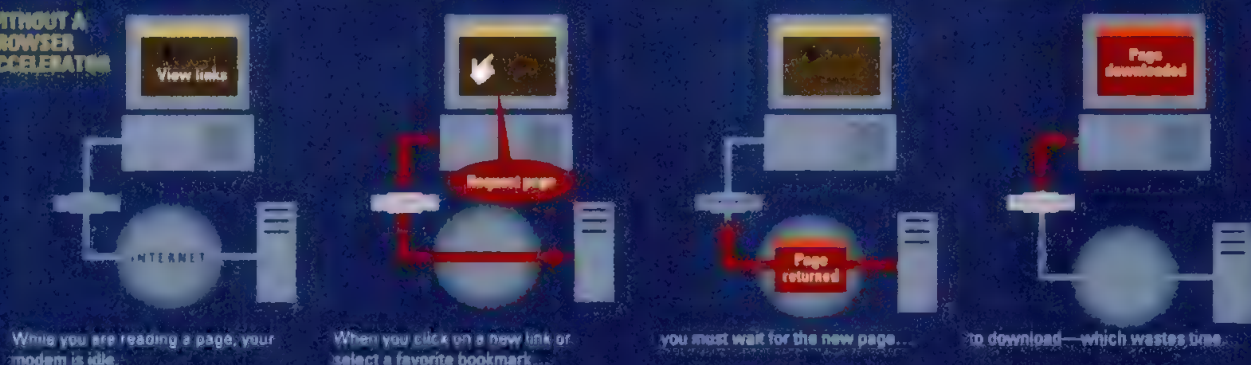
HOW IT WORKS BROWSER ACCELERATORS

A browser accelerator can noticeably improve the speed of your Web surfing if you give it enough time to work. During accelerated Web surfing your modem is constantly active (whereas during unaccelerated surfing your modem is idle while you read). This means that you get fast access to linked pages.

WITH A BROWSER ACCELERATOR



WITHOUT A BROWSER ACCELERATOR



hop from page to page, though, you won't see the desired benefit.

All but one of the programs communicate with your browser by installing themselves as *local proxy servers*. This means that when you tell your browser to open a remote page, the browser asks the accelerator for the page instead of going directly to the Internet. The accelerator, in turn, either hands over the page from its cache or fetches it from the Internet.

The proxy-server method works, but it adds a level of complexity and unreliability that you may not want. For example, with most accelerators, if your system crashes or if you unload the browser and accelerator in the wrong order, you may not be able to access the Internet through your browser unless you start up the accelerator again or reset the browser option that tells the browser to use a proxy server. Expert users can handle these problems, but many users won't be able to figure out how to restore their access to the Internet.

Most of these programs can be downloaded and checked out before buying. If you value your time, you owe it to yourself to try them.

GO AHEAD SOFTWARE INC.

Go Ahead Got It!

All reviews by Edward Mendelson



The only browser accelerator that gives you ultimate control over which pages are prefetched, Go Ahead Got It! 3.01 not only preloads pages linked to the current page but also notifies you when selected remote sites change, downloads subscribed-to sites at regular intervals, and supports off-line browsing with a catalog of pages stored in its disk cache. Go Ahead Software's inexpensive package—\$19.95 downloaded, \$29.95 on disk—may be more accelerator than you need, and its interface needs work, but it is the most complete program on the market for high-speed surfing and off-line browsing—and may be the fastest.

In informal testing, Got It! produced moderate speed increases on many sites and impressive speedups on others. The

accelerator sometimes got confused and would not display certain pages until we exited and restarted the program, but its operation was generally smooth.

Like many of the products in this roundup, Got It! doesn't feature much of an interface. When it's running, a Got It! icon appears in your taskbar tray, and the icon's pop-up menu opens a control panel that looks like a VCR remote control. Buttons on the control panel dial into the Internet, open Got It!'s advanced options in the browser, start downloads of subscribed pages, and open lists of cached files, which can be opened in the browser by clicking on their URLs.

A "news" page displays a list of subscribed-to Web pages with new changes. You can add a page to the subscription list by right-clicking on Got It!'s taskbar icon or from the control panel.

When you start up Got It!, it installs itself as a local proxy server. Unlike PeakJet and Surf Express, Got It! won't leave

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your browser unusable after a system crash. Instead, it restores the original proxy settings when you reboot.

Go Ahead Got It! 3.01. List price: Download, \$19.95; disk, \$29.95. Requires: Microsoft Windows 95 or NT 3.51 or later, 8MB RAM, 10MB hard disk space, Microsoft Internet Explorer 3.0 or later or Netscape Navigator 3.0 or later. Go Ahead Software Inc., Redmond, WA; 800-631-0806, 425-882-1900; www.goahead.com. Choose 520 at www.pcmag.com/infolink.

INNOVATIVE SOFTWARE GMBH

Java Booster

Unlike most other programs in this roundup, which prefetch favorite pages or pages linked to a current browser page, Java Booster 1.0a only speeds access to pages you've already visited before, using its intelligently designed, searchable cache in place of your browser's cache. This \$29 browser accelerator from Innovative Software is perhaps best used as an off-line browser, since it can preserve specified pages in its cache indefinitely. It also preserves all the Java applets connected to those pages so you won't have to download them later—hence the name.

To use Java Booster, you must change your browser's proxy settings so that the browser fetches pages from Java Booster instead of from the Internet. Until you change the proxy settings again, you are able to access the Internet only when Java Booster is running. The program opens a small control-panel window with buttons for switching between online and off-line modes and for opening option dialogs,

EDITORS' Choice

→ Go Ahead Got It! 3.01

In case you're not quite ready to upgrade your slow modem connection and want a little performance boost, only one product gives you ultimate control over which pages you want to prefetch and when you want them. And so we recommend Go Ahead Got It!, from Go Ahead Software, as our Editors' Choice.

Got It! is the only product in this roundup that lets you specify which pages to preload, giving you ultimate power over accelerating your surfing experiences. You can also have the program preload frequently visited pages, and it's the only program to notify you of when pages have changed.

Got It! is the most feature-rich

browser accelerator available. It also supports off-line browsing, and it gives you a hyperlinked list of sites that have been cached by the program for even easier access to preloaded pages.

For those interested in a product that doesn't set itself up as a local proxy server to do its job, NetAccelerator, from IMSI, takes a no-muss, no-fuss approach to speeding up Web surfing. NetAccelerator's feature set is paltry when compared with that of Got It!, but it offers a simplified approach.



which appear in the browser. The dialogs use enormous fonts for their headings, so you must scroll down a screen or two before finding the options you want.

A text-search feature lists pages in the cache that contain specified text; you can click on the URLs to display the pages in the browser. Surf Express (which uses its own cache and doesn't prefetch pages) is the only other product to have its own search function, which is more advanced, offering Boolean searches.

Java Booster 1.0a. List price: \$29. Requires: Microsoft Windows 95 or NT 3.51 or later, 4MB RAM, 5MB hard disk space, Microsoft Internet Explorer 3.0 or later or Netscape Navigator 2.0 or later. Innovative Software GmbH, Frankfurt am Main, Germany; 49-69-236929; www.isg.de. Choose 521 at www.pcmag.com/infolink.

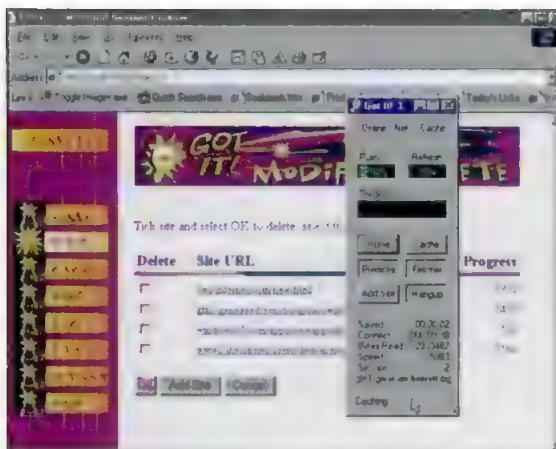
IMSI

NetAccelerator

The simplest and most trouble-free browser accelerator on the market is NetAccelerator 1.1. IMSI's package (\$30 street) is

the only one we found that doesn't install itself as a local proxy server or make you fiddle with option settings. You can surf the same way you already do—only faster: It offers moderate but noticeable speed improvements. NetAccelerator works in the background to preload pages linked to the current page and pages that you visit often. It lacks some of the off-line browsing and control features that Got It! offers but is an effective, single-purpose utility.

When you start NetAccelerator, it opens a control panel with two buttons for loading either IE or Navigator. Even before you click on a button, NetAccelerator starts running invisible copies of your browsers and then opens ordinary, visible copies when you select a browser. While you surf the Internet in the visible copy of the browser, the invisible copy preloads linked and most-often-accessed pages. The accelerator then stores the pages in the browser cache for quick access when you open them in the visible browser. Unlike the other programs, which work as proxy servers, NetAccelerator doesn't change any browser settings, and it won't prevent your browser from accessing the Internet when you reboot after a system crash.



GOT IT!'s tray icon opens its compact control-panel interface, and much of its functionality is managed within the browser.

You can pause prefetching with a button on the control panel when you need full Internet bandwidth for e-mail or other nonbrowser Web tasks. The only inconvenience you'll face with NetAccelerator is the on-screen presence of its control panel, which fortunately can be minimized to the taskbar and ignored.

IMSI also offers NetAccelerator Deluxe, a \$50 package that bundles NetAccelerator with six third-party Internet utilities.

NetAccelerator 1.1. Street price: \$30. Requires: Microsoft Windows 95, 8MB RAM, 2MB hard disk space, Microsoft Internet Explorer 3.01 or later or Netscape Navigator 3.01 or later. IMSI, San Rafael, CA; 800-833-8082, 415-257-3000; www.imsisoft.com. Choose 522 at www.pcmag.com/infolink.

PEAKSOFT CORP.

PeakJet

Written entirely in Java, PeakSoft's PeakJet 1.56 (\$29.95 list) prefetches pages linked to the current page, automatically refreshes pages stored in its cache at regular intervals, and includes an option to store sets of downloaded sites or groups of sites in separate caches. Using the latter feature, you can refresh different groups of sites at any time. In informal testing, PeakJet did produce noticeable improvements at many sites. Despite these features, PeakJet's limited Java interface, complicated configuration scheme, and problem loading pages using style sheets make it less useful than Got It!, NetAccelerator, or WebEarly.

When you start PeakJet, it loads a six-button toolbar and installs itself as a local proxy server. If you close down the browser before closing PeakJet or if your system crashes with PeakJet running, you may have to reset your browser's proxy settings by hand before you can access the Internet again. PeakJet replaces your browser's cache with its own, and you also have to restore the browser's cache settings or use a program supplied with PeakJet to restore both the original proxy and cache settings. The accelerator works with only one browser at a time, and you must find and run a configuration program to switch browsers.

The toolbar includes buttons that let you pause preloading when you want to maximize bandwidth for e-mail or other

Internet tasks (a feature that NetAccelerator also offers). And you can turn off the program's use of the cache so you are able to reload pages from the Internet.

You can view lists of preloaded URLs linked to the current page or in the full cache, but the lists have little value because you can't click on a listed URL to open it in the browser, as you can running Got It! PeakJet gets confused by pages linked to external style sheets, preloading only the style sheets and ignoring all other links. If you prefer the keyboard to the mouse, don't use PeakJet: It has no keyboard support at all and doesn't even use the Tab key to switch between buttons.

PeakJet 1.56. List price: \$29.95. Requires: Microsoft Windows 95 or NT 3.51 or later, 16MB RAM, 4MB hard disk space, Microsoft Internet Explorer 3.0 or later or Netscape Navigator 2.0 or later. PeakSoft Corp., Bellingham, WA; 360-752-1100; www.peak.com. Choose 523 at www.pcmag.com/infolink.

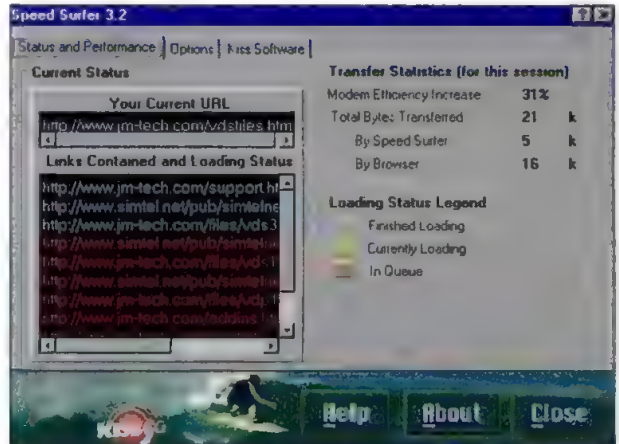
KISS SOFTWARE CORP.

Speed Surfer

A simple accelerator with no off-line browsing or cache management features, Speed Surfer 3.2, from Kiss Software Corp. (\$30 street), prefetches pages linked to the current page well. Because it installs itself as a proxy server, though, the program can be more difficult to use than NetAccelerator. In our informal testing, we found moderate but noticeable improvements in loading linked pages; but like most prefetchers, Speed Surfer works best when you stay at one site for a few minutes or more. Speed Surfer automatically preloads your ten most visited sites, so you'll find it more effective if your surfing habits tend to bring you back to the same pages.

Speed Surfer installs itself as a local proxy server in the browser you set it to launch. As with some other proxy servers in this roundup (such as PeakJet), if you close your browser before closing Speed Surfer, or if your system crashes with

Speed Surfer running, the browser may not be able to access the Internet until you restore its proxy settings by hand. On our tests, Speed Surfer sometimes got confused after a system crash and didn't restore the original proxy settings even after it loaded and unloaded properly.



KISS SOFTWARE CORP.'S SPEED SURFER logs all incoming URLs, but they aren't hyperlinked.

The program normally appears on-screen only as an icon in the taskbar tray. If you click on the icon, you can open a status screen that lists the URLs Speed Surfer has downloaded or queued for downloading. The list isn't especially useful, though, because you can't click on an URL and open it in the browser as you can in Got It! Downloaded files are stored temporarily in Speed Surfer's own cache and then transferred to the browser's cache; any preloaded pages that you don't view are discarded when you open another Web site in your browser.

Speed Surfer 3.2. Street price: \$30. Requires: Microsoft Windows 3.1 or Windows 95, 8MB RAM, 3MB hard disk space, Microsoft Internet Explorer 3.0 or later or Netscape Navigator 2.0 or later. Kiss Software Corp., Newport Beach, CA; 888-454-7726, 714-979-5477; www.kissco.com. Choose 524 at www.pcmag.com/infolink.

CONNECTIX CORP.

Surf Express

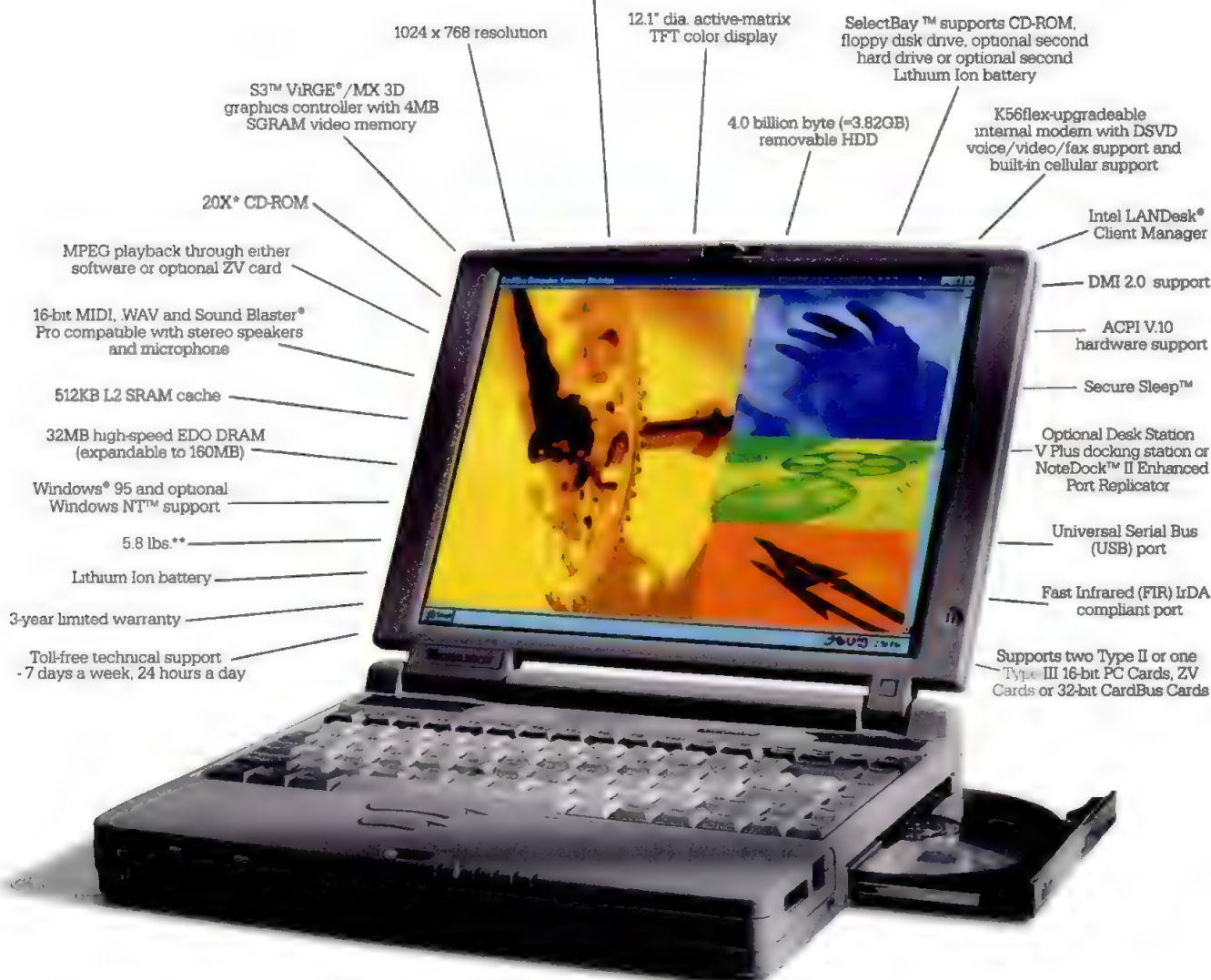
With a sophisticated search feature that sets it apart from other programs in this category, Connectix Corp.'s Surf Express 1.0 (\$34.95 list) provides remarkably fast access to Web pages that you've already visited. The program doesn't prefetch pages linked to the current page in the

Browser Accelerators

☒ YES ☐ NO

MARCH 24, 1998 PC MAGAZINE 201

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INTERNET SEARCH AND NAVIGATION TOOLS

FIND information faster

The sheer vastness of the Web can be frustrating.

These search tools pick up where the search sites leave off. By Alan Cohen and John Garriss

Finding Web sites on the Internet has never been a problem. Finding the right sites has been. Each search engine plays by its own rules, returning different results in a different order for any given request. Metasearch sites—which query multiple engines simultaneously—can help, but they often return

extremely long lists of hits, then offer little assistance in managing and organizing the links or in setting up recurring searches.

That is where off-line search tools come in. We looked at nine desktop products, searching for those with the cleanest interfaces that best eliminate duplicate and invalid links, integrate results from many search engines, and let you group links by category and store them for later reference. We also sought out automated search functionality. Which tool will work best for you? That depends on what you are looking for—and how you want to find it.

Of course, sometimes you don't want a list of every site that references a particular topic: You just want to know where to go next. We looked at two products that can help you browse the Web more efficiently—Alexa 1.2 and NeoPlanet. Of the two, NeoPlanet is better for novice users; those with more Internet savvy will get the most out of Alexa. Our graphical look at the two products will show you how it's done.

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Off-Line SEARCHING

When you're doing a major research project, just going to one search site won't do. An off-line search utility will help you query multiple search engines at once and manage the results. (The numbers in square brackets can be selected at www.pcmag.com/infolink for product information.) By Alan Cohen

★★★★★—Best	Interface	Engines queried	Results management	Advanced features
Copernic 1.1 www.copernic.com , download, \$29.95 [574] 	★★★★★ Intuitive to use, Copernic displays the progress of a new search and lets you choose from two different types of searches: Simple (enter a few keywords) and Advanced (specify the maximum results desired from each engine as well as total results)	★★ Copernic queries just ten general search engines (including AltaVista, DejaNews, Excite, HotBot, and Lycos). You can choose which engines to search	★★★★★ Search results appear in a formatted Web page. Copernic integrates the links, removing duplicate and unreachable titles. Sort options include rank, title, address, and date found. You can choose to display only the new results of a repeated search	★★★★★ Copernic lets you save your searches and update them later, with the most recent finds highlighted. An auto-update option guarantees that you'll always be using the most recent version
CyberSearch 3.0 www.frontiernet.com , download, \$99.00 [575]	★★ Even with hyperlinked help and a search wizard to get you started, CyberSearch is confusing to use. The program does not return any results until all engines are searched. Tabbed folders store the results of searches, but their layout is awkward	★★ CyberSearch queries a very small number of Web-based engines: AltaVista, Excite, Infoseek, Lycos, and Web Crawler. You can specify which sites to use. You can configure the program to search intranet sites and even local hard disks	★★★ Results are not integrated, but duplicate links are eliminated. Displayed information includes a title, a URL, an abstract, and relevancy (if calculated by the engine that found the link). Results can be saved, organized, and dragged between categories.	★★★ CyberSearch can monitor results so you will know when a document has been modified. When a search returns a local file, a mouse click will launch the appropriate application. Searches can be set to run when CyberSearch is started
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Inforia Quest 97 www.infonia.com , download, \$19.99; boxed package with CD-ROM and manual, \$24.99 [577]	★★★★ Inforia Quest has two interface styles: Essence, for frequent users, and Wizard, which leads you through the query process. The program makes good use of icons and is easy to use	★★★★★ Over 150 search sites are supported, as well as specialized databases for entertainment, news, software, and technology. You can also search Usenet and online yellow pages. You can edit site categories and even create a custom list of engines	★★★ Inforia eliminates duplicated and invalid URLs and displays title, URL, description, link size, and the engine that found it. Links and text abstracts are displayed as they are found. You can save searches and merge results from different queries	★★★ An auto-update function adds new search engines automatically (you cannot add them on your own, however)
Web Compass 2.0 www.quarterdeck.com , download, \$49.95 [578]	★★★ Web Compass is a full-blown Windows program, and there is a lot happening on the screen. The interface is not very intuitive, but good hyperlinked help and wizards assist you in setting up searches	★★★★ Web Compass includes support for over 35 search engines, including specialized sites such as CNN and ZDNet. You can add or delete sites and even specify intranet resources to check. Engines are grouped by category	★★★★★ The results page is not the prettiest, but it contains a title, a relevancy rating, the engine that found it, the number of images, and embedded links. Web Compass can organize links by content and automatically place and save them in folders	★★★★★ Web Compass supports automated searches, which are performed in the background. The program automatically updates earlier search results, though new links are not highlighted, and you get a great deal of control in scheduling
WebFerretPro www.ferretsoft.com , download, \$26.95 [579]	★★★★★ WebFerretPro pops up as a half-screen window. The simple interface is easy to use; you type in a few keywords and go. A feature called What's This? is especially helpful: Point to any part of the screen and an explanation pops up	★★★ You can pick and choose which engines to use, but the selection is limited. The program supports 18 sites, including a few you may not find elsewhere (such as Answers). There are no predefined categories	★★★★★ WebFerretPro removes duplicate links and displays titles and URLs. If the engine that found the link ranked it, that score is noted. Otherwise, the link is sent to the bottom of the list—though it may be the most relevant. You can save results	★★★★★ The program automatically adds new search engines (though you cannot add them manually)
WebSeeker 3.2 www.bluesquirrel.com , download, \$49.95 [580]	★★★★ WebSeeker boasts good hyperlinked help. A useful feature, Findnow, automatically initiates searches. In the active application, highlight text you want to search for and click on the WebSeeker icon in the tray	★★★★★ WebSeeker supports over 100 search engines, both general and specific. You can pick and choose which sites to use or select a predefined set (in categories such as <i>entertainment</i> and <i>technical</i>). A wizard lets you add new search engines	★★★★ WebSeeker can remove duplicates and invalid links. It integrates results, but they are listed alphabetically. Icons note which links have been browsed and which are invalid or have changed since the last search	★★★★ You can save searches and run them again at another time, with new results highlighted. Interim software upgrades are automated (but major revisions will cost you)
Web Sleuth 1.5 www.promptsoftware.com , download, \$39.95 [581]	★★★★ This program uses multiple windows to display results and page views simultaneously. In case that's too much clutter on-screen, you can close any window. Still, this program may seem a bit overwhelming to novices	★★★★ Web Sleuth supports 34 search engines, including Reader's Digest and U.S. Code. Some choices seem random. Pathfinder is included but CNN is not. You can pick which sites to use or use predefined groups (such as <i>legal</i> or <i>news</i>)	★★★★ Web Sleuth does not rank results, though it does eliminate dead links. It gives no descriptions. A feature called Exact Match discards pages that do not include your keywords. The program indexes all words and phrases found during the search	★★★★ The utility automatically updates its search-engine list
Zurfrider www.zurfr.com , download, \$19.95 [582]	★★ Zurfrider has a slick interface but offers limited, Web-based help. You cannot view links while the search is in progress, and many options are far from intuitive	★★★★ The program searches 29 sites, including both general resources such as AltaVista and specialized databases such as Cinemachine and CNN. There is an option to add new search engines, but the interface is confusing, and no help is provided	★★★ Zurfrider integrates and ranks results. Dead links are eliminated, as are documents that fall below a user-defined relevancy score. To refine results, which are then organized into groups and saved, you can add new keywords or specify ones to reject	Zurfrider has no advanced features

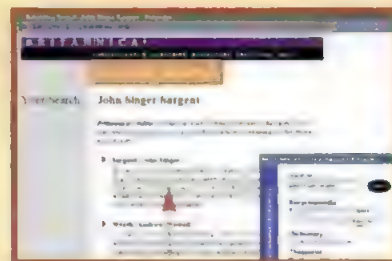
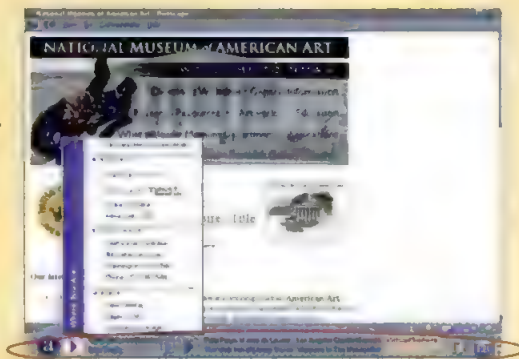
NAVIGATION Utilities



Getting around the Web has never been easier than with the help of one of these excellent free tools. By John Garriss

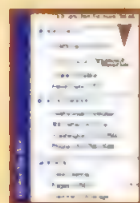
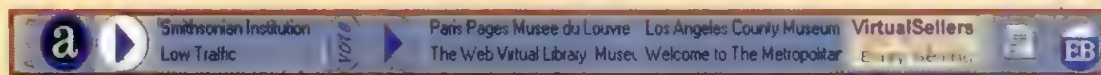
Alexa

Alexa 1.2 makes navigating the Web a lot more fun. It's a small toolbar that works with your existing Web browser. As you navigate the Web, Alexa helps steer you to where you might want to go next, with a list of related links for any site you visit. Alexa also searches its database to give you information about a site you're browsing. (Alexa Internet, www.alexa.com.) [516]



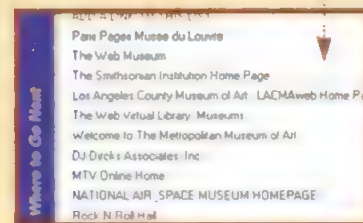
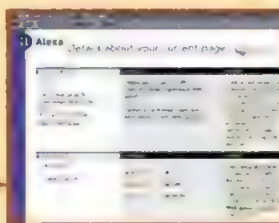
Alexa provides an easy-to-use interface to a limited version of Encyclopaedia Britannica's online encyclopedia.

Wherever you go on the Internet, Alexa provides a list of related Web sites that you may want to visit next. Usually the suggestions are quite good, although occasionally you may get sent somewhere unrelated.



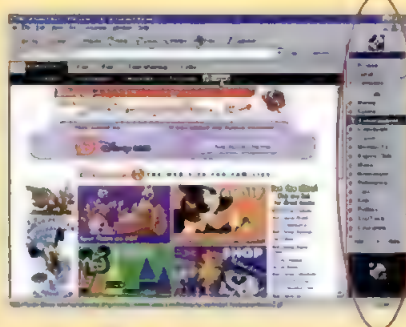
When you click here, a pop-up menu appears, giving you the site's owner, address, quality, and popularity.

Clicking on any item on the menu (left) gives you more details and an explanation of where the data comes from.

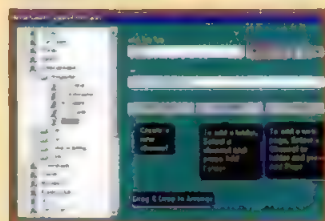


NeoPlanet

Do you find Internet Explorer and Navigator too unintuitive to use? Then try NeoPlanet, a fully functional Web browser that makes it easy to get to the Web's most popular sites. We found it very intuitive and a good choice for Web novices or kids just getting used to the Internet. You need Internet Explorer to get started. (Bigfoot Partners, L.P., www.neoplanet.com.) [517]

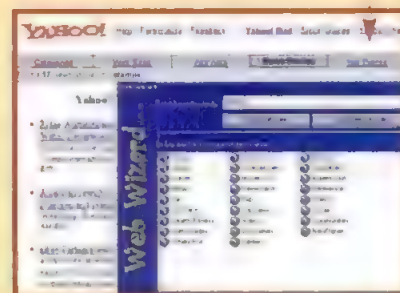


The channel designer screen makes it easy to set up categories and add new sites or channels to them.



NeoPlanet makes it easy to get to Web sites. You click on a category, and a listing of nested folders and Web sites appears under the URL bar.

NeoPlanet lets you perform Yahoo! Web searches directly from your Web browser without having to go to the Yahoo! Web site first.



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INTERNET INSTANT MESSAGING UTILITIES

SEND quick messages

Though it needs to leap some early hurdles—such as the interoperability problem—instant messaging is a promising tool. By Alan Cohen

Instant messaging software offers a tantalizing proposition: Combine the speed of real-time conversation with the functionality of e-mail. Send quick notes to friends and colleagues; attach files, URLs, and even invitations to join in group chat without creating large e-mail databases. The promise: Communicate—and collaborate—faster, better, and cheaper than ever before.

The problem? So far, no one package really does it all. AOL Instant Messenger

Chat don't require you to connect to an external server but offer no "buddy lists." And the product with almost every option imaginable, ICQ, comes wrapped in a primitive, unattractive interface.

Then you have the interoperability issue. Instant messaging software is now in its VHS/Betamax stage. If you want to start communicating and collaborating in real time, all parties need the same software. Microsoft, which currently offers instant messaging for Microsoft Network members but not the general public (thus its service is not reviewed here), has submitted a proposal to the Internet Engineering Task Force to establish a standard for these applications. The most glaring omission from the 40 vendors backing the idea: AOL.

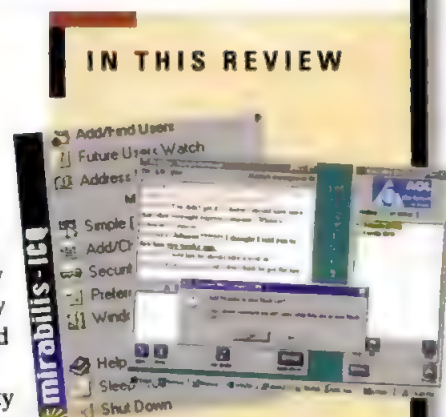
AIM is compatible with the buddy lists built into AOL itself, giving users a direct line to 10 million people, an advantage that AOL doesn't wish to share.

Like e-mail and Web surfing, instant messaging can enhance productivity—or end it altogether. These nine packages, all free downloads, offer a glimpse into what may be, for better or worse, the future of online communication.



(AIM) offers a sleek, intuitive interface, but it lacks group chat and file transfers. PeopleLink allows multiple-party conversations, but its visual cues and privacy features are awkward. NetPopUp and Peer-

IN THIS REVIEW



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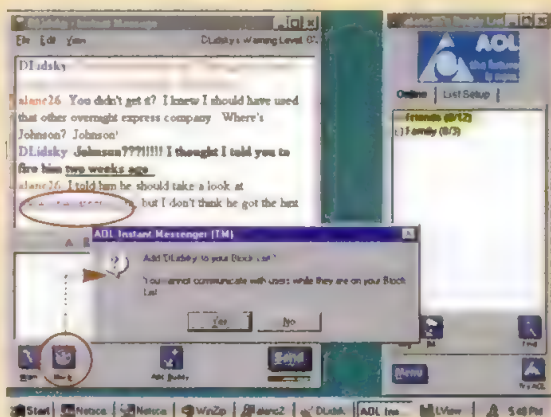
For more information on a given utility, find the number in square brackets at the end of the product's review, then choose that number at www.pcmag.com/infolink.

AOL Instant Messenger

Don't let the simple interface fool you: Easy to use and highly customizable, AOL Instant Messenger (AIM) is the most intuitive chat package we've seen. AOL users get some preference by getting access to AOL member profiles. For all others, a limited directory search is available. For basic one-on-one chat, AIM takes top honors. But if group chat and file transfers are more important than an intuitive, user-friendly interface, the better choice is ICQ. (America Online Inc., www.aol.com.) [649]

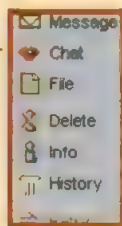
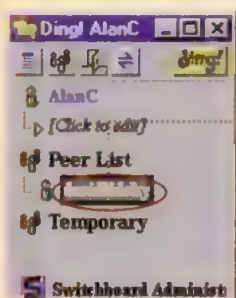
You can send URLs and set font colors and text attributes easily from the message window toolbar.

When an incoming message is received, you can add the sender to your buddy list or to your "block" list, where that person won't be able to "see" or communicate with you.

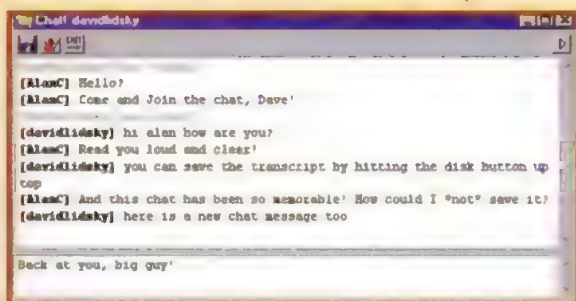


Ding!

Ding! suffers from the same problem as ICQ: nice features with an ugly chat window. You get group chat, a searchable user directory, and file transfers. Ding! adds some unique touches, including a Watchers List that monitors all those who have added you to their buddy lists—even if they're not on your list. (Activeverse, www.activeverse.com.) [650]



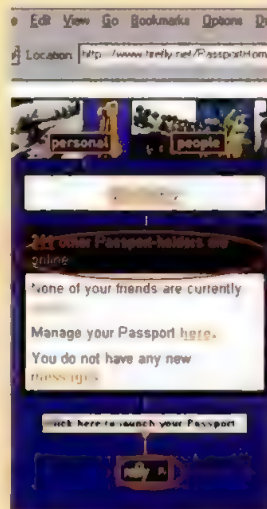
Right-click on a user name to select from your menu options, including Chat.



In Ding!'s chat window, all text appears in the same **drab font**. Worse, you get just two lines of space in which to type.

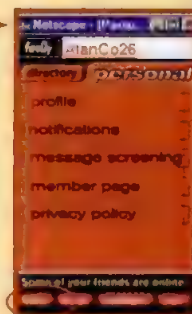
Firefly Passport

Firefly Passport is the only product here without client software. The instant messaging features are Web-based. You get a personal Web page, a Flymail box, and access to chat rooms and bulletin boards. Users wanting to send files or URLs are out of luck. Web-based instant messaging is slow and clunky and cannot be recommended. Yet Firefly offers some unique personalization features, making it useful for meeting like-minded individuals. (Firefly Network, www.firefly.com.) [651]

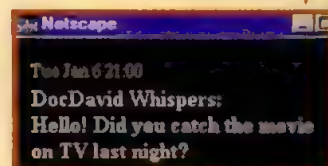


From your Passport home page you can see whether friends are online and launch your Passport (below).

Though Firefly Passport keeps track of friends who are online, it does a better job of linking like-minded strangers. Personal Web pages let members tell a little about themselves, and a user directory is searchable by interests.

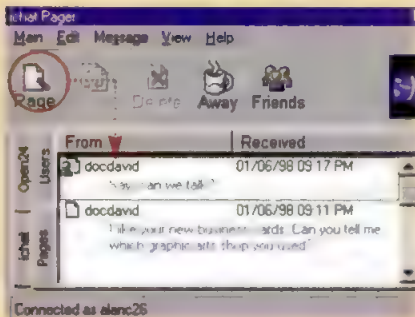


Whispers, Firefly's version of instant messages, aren't pretty. You can't set text attributes, and all messages appear in small, strange-looking black boxes.

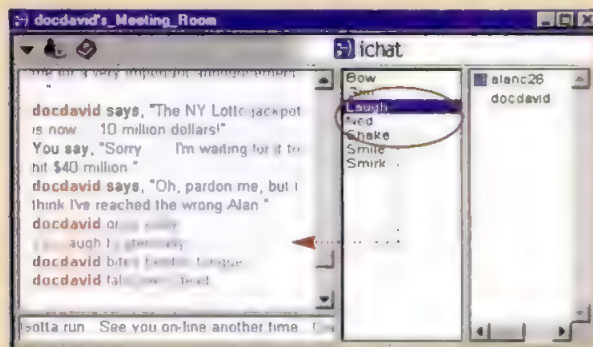


ichat Pager

ichat Pager has features not found in AIM, such as file transfer, multiple-user chats, and a highly searchable user directory. Elegant, however, it is not. Users need to page one another before initiating a chat, a two-step process that is one step too many. For those who don't need to transfer files or links, PeopleLink offers more bang for the byte. (ichat Inc., www.ichat.com.) [652]



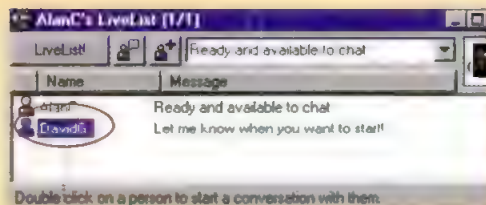
Pages appear in separate incoming and outgoing windows, making even one-on-one conversations difficult to follow.



You can build your own list of emotions, handy for letting others gauge your online mood. If no predefined emotion fits the situation, you can create your own (such as "grins evilly").

LiveList

LiveList proved one of the weakest products in this roundup. You won't be able to save a chat, and the message size limit is about 65 words. LiveList does offer group chats and multiple simultaneous conversations. (OnLive Technologies Inc., www.onlive.com.) [654]

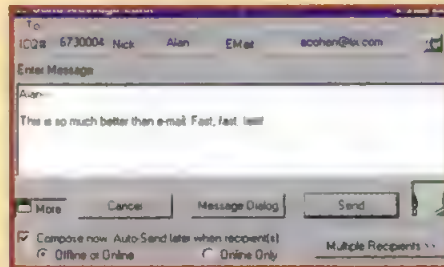


LiveList's use of icons borders on the clever. Choose the **Do Not Disturb** option, for example, and a newspaper will appear in front of your on-screen visage.

ICQ

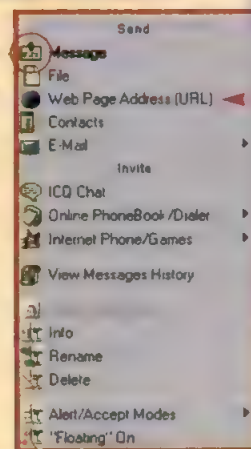
EDITOR'S CHOICE

The key word for ICQ, our Editors' Choice, is *features*. ICQ offers more than any other package we looked at: file and URL transfers, off-line message composition, e-mail notification, message forwarding, multiuser chat, contact lists, excellent visual alerts, and a wealth of configuration options. (Mirabilis Ltd., www.mirabilis.com.) [653]

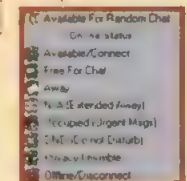
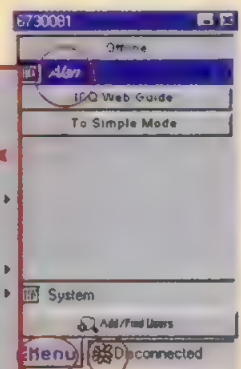
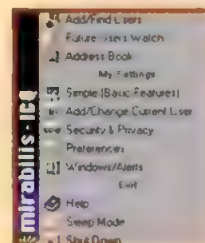


ICQ's interface, as seen by the main client and this message window, is something only a DOS fan could love.

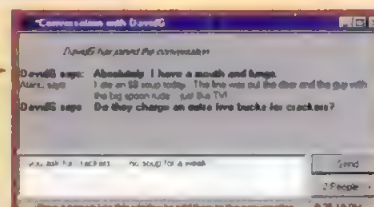
Right-click on a user name to see ICQ's many options.



Initiate a **Quick Chat** once you have made contact. Here, all conversation takes place in one window. Multiple users can join in, and private messages can be sent between participants.



ICQ lets you display your current status to other users. The status icons take a bit of getting used to, but your options are unparalleled.

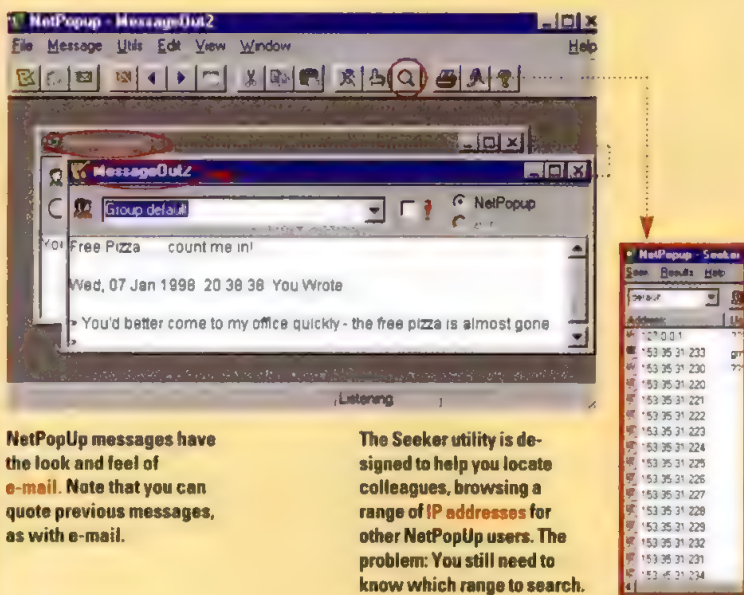


Unlike PeopleLink, LiveList uses the same interface for both one-on-one and group conversations. The result: fewer windows to manage on-screen.



NetPopUp 2.23

NetPopUp works more like instant e-mail than instant messaging: It's useful for sending a few short notes but not for prolonged conversation. Each message is displayed in a separate box, quickly filling up your screen. As with PeerChat, you don't connect to an external server; instead, you need to know each colleague's IP address—making this one of the more difficult programs to set up. Yet for those willing to make the effort, some rewards await: You can send a message to multiple users simultaneously. (Jamsoft, www.vtoy.fi/~mala/netpopup.html.) [655]

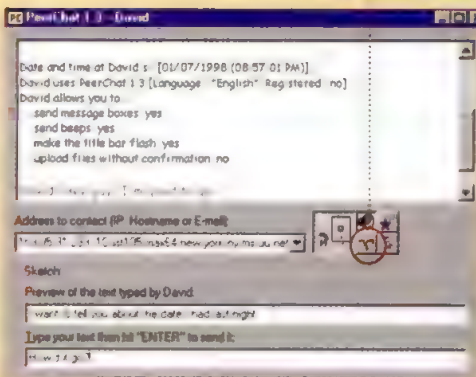
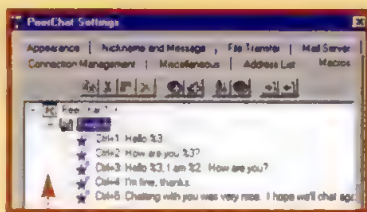


NetPopUp messages have the look and feel of e-mail. Note that you can quote previous messages, as with e-mail.

The Seeker utility is designed to help you locate colleagues, browsing a range of IP addresses for other NetPopUp users. The problem: You still need to know which range to search.

PeerChat 1.3

PeerChat differs from most chat programs in that there is no external server: Instead, users link directly to other users. The downside: Contact is initiated via e-mail, a process that is longer (and more complex) than checking buddy lists. And be warned: Help is minimal. (Claudin Lambert, www.peerchat.com.) [656]

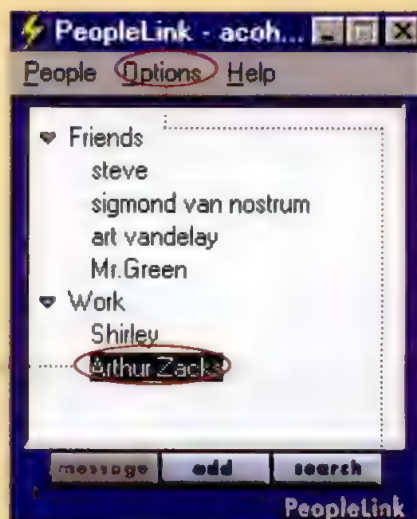


Users can define up to 2,880 text macros—phrases that often appear in conversation—which is a potential time-saver.

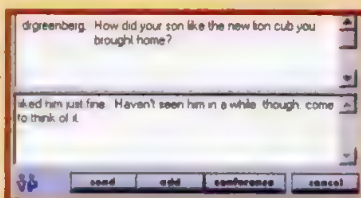
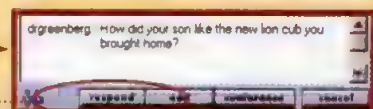
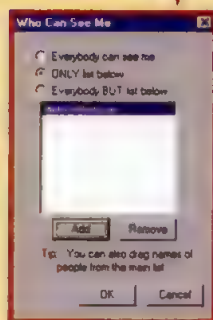
Each message must be typed within a single dialogue line. Hit Enter and the text appears in a larger chat window.

PeopleLink 1.11

PeopleLink's most notable feature is its group chat, which comes in an otherwise relatively lean package. Files and URLs cannot be sent, and text attributes cannot be set. Privacy features are poorly implemented, as you cannot stop an already started conversation by going "hidden" as long as the other party keeps your chat window open. (PeopleLink Inc., www.peoplelink.com.) [657]



PeopleLink lets you request a list of all users who have added you to their contact lists—which is useful for keeping tabs on those who are keeping tabs on you.



Your conversation takes place in a two-pane window. You can save chats after you are done.



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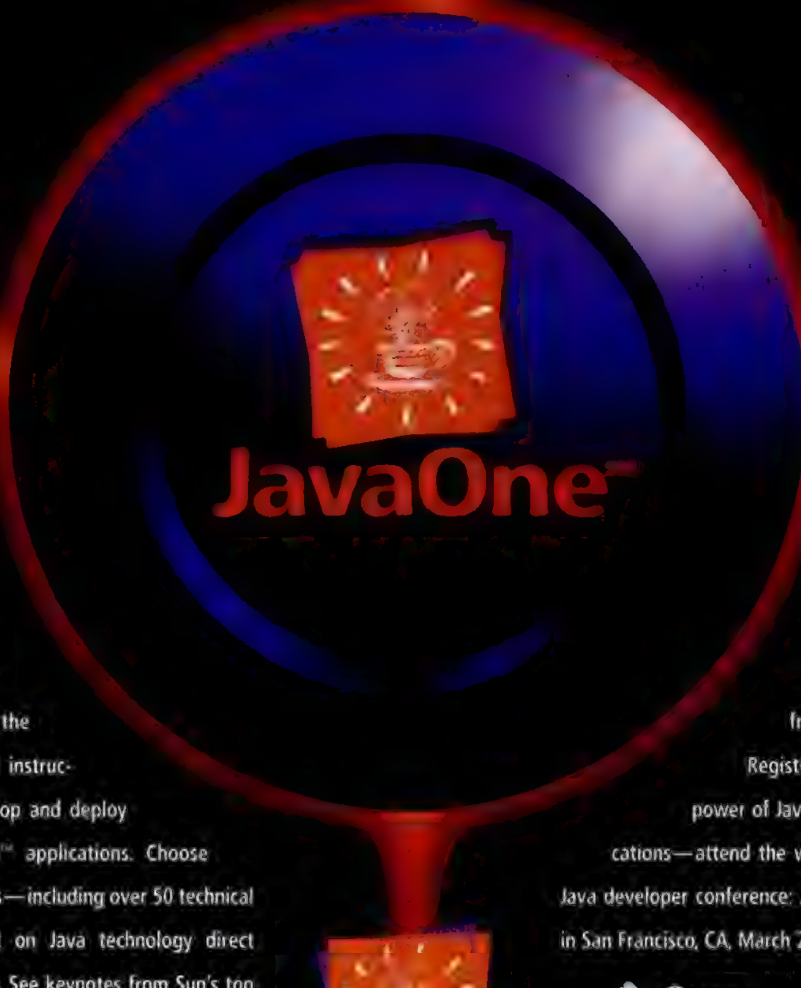
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INTERNET MISCELLANEOUS

COMPLETE your Net toolbox

Here we've pulled together a few more tools to help you make more productive use of your time online. By Doug Beizer and Jennifer Anderson

You've got your filtering tool, browser accelerator, off-line search tool, navigation utility, and instant messaging client. What else do you need to complete your Internet utilities kit this year? Take a look at what we have for you.

Nothing's more annoying than checking your e-mail and realizing that you have no new messages. We review 16 e-mail notifiers that check for you, saving you the effort.

Then, if you're really into updating your Web page or downloading files from the Internet, you may need a more sophisticated file-transfer utility than the one that comes with your browser. We look at 16 of the latest advanced FTP utilities and tell you which ones make uploading and downloading files easy.

Some once-lively browser-utility categories have largely gone

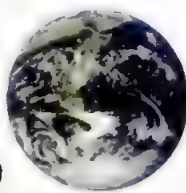
the way of billboards without URLs, because Microsoft and Netscape have added comparable technology into their browser suites. We look at what's left of the off-line browser,

push, collaboration, news-reader, and bookmark-manager markets, comparing the products with what you get with Microsoft Internet Explorer 4.0 and Netscape Communicator and offering recommendations for what you might need.

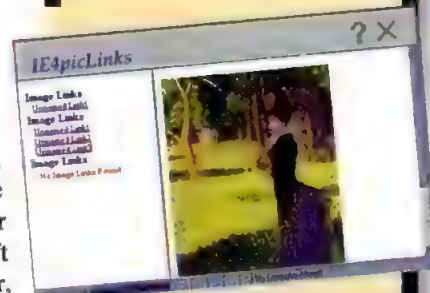
Finally, we check out some new browser utilities (all available via download) that let you free your toolbars from the top of your screen, search and index Web sites on your terms, and highlight the graphical experience of the Web. Now your Internet toolbox is complete.

FLOATING TOOLBARS

Even though the Version 4.0 browsers offer toolbars that can be rearranged



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For more information on a given utility, find the number in square brackets at the end of the product's review, then choose that number at www.pcmag.com/infolink.

All prices are direct unless otherwise indicated.

Best Socket-7 Motherboard Based on Intel's TX Chipset

1st

Shuttle Hot-569



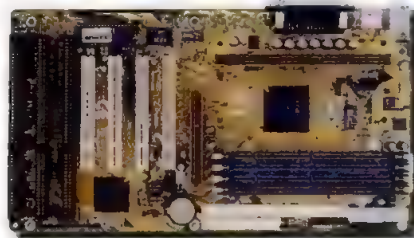
"This is Shuttle's second example of how Intel's latest chipset can be put to good use. Not only is it great with the Pentium MMX and K6, it is one of the fastest TX based motherboards I've tested with 6x86MX chip"

ANAND Hardware Tech Page

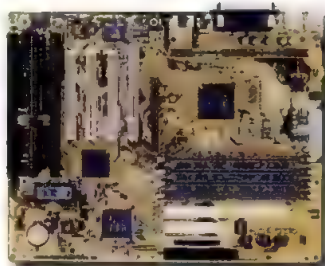
Despite all the awards & ratings,
Shuttle still offers high quality mainboards that feature
exceptional performance, reliability and expandability
at a very competitive price.



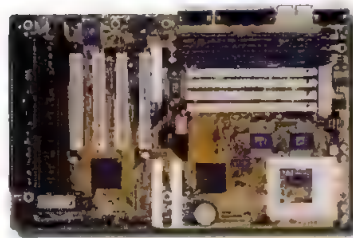
PC Direkt (Germany)
Editor's Choice



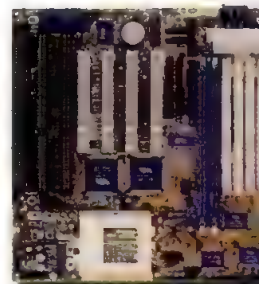
Hot-637



Hot-635



Hot-567
(Hot-566)



Hot-579



- Accelerated Graphics Port Interface (AGP)
- Slot 1 for Pentium II Processor with MMX™ Technology
- Supports PENTIUM II Processors Up to 333 MHz
- Supports 4 banks of SDRAM and EDO DRAM
- Configurable support for ECC
- Supports Ultra DMA/33
- Ultra-Wide SCSI Controller available on HOT-635
- Intel's LDCM (optional)

- CPU Plug & Play
- Low EMI (Easy CE/FCC)
- System Manager
- Power Plug & Play
- Full Memory Support
- Value Added Softwares
 - System Manager (Std)
 - Triones' Busmaster IDE driver (Std)
 - Win95-TX utility (Std)
 - Intel's LDCM (Optional)
- VIA VPx/97 Chipset
- Supports CPU Voltage Auto-Detect
- Supports SDRAM and EDO DRAM
- System Manager
- Supports Ultra DMA/33
- On-board 1MB or 512k PB Cache



<http://www.spacewalker.com>

Choose 016 at www.pcmag.com/infolink

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E-Mail NOTIFIERS

Check your e-mail regularly throughout the day without leaving your mail software loaded. Try loading up one of these compact e-mail notification utilities. (The numbers in square brackets can be selected at www.pcmag.com/infolink for product information.) By Sheryl Canter

★★★★★—Best

Auto-Bot MailCheck 1.0d3
www.starbase21.com,
free [588]

CheckMail 32 1.50
[datastod.simplenet.com/
indexproducts.htm](http://datastod.simplenet.com/indexproducts.htm),
shareware, \$12.00 [589]

EDITOR'S CHOICE

CheckPOP 1.02
vzone.virgin.net/m/hay/,
shareware, \$15.00 [590]

e-Mail Notify 1.21
www.netsurf.org/~zic/,
free [591]

EMailR32 2.0
www.npx.com/charison/,
shareware, \$10.00 [592]

ESP Mail Check 1.13
xoom.com/espmc/,
free [593]

JustPOP3 1.9
[www.geocities.com/RainForest/
4380/](http://www.geocities.com/RainForest/4380/),
free [594]

Lydia 2.2
magiicarpnet.com/~kbingham,
shareware, \$10.00 [595]

MailAlert 1.65
www.diamondridge.com,
shareware, \$15.00 [596]

Mail Checker
[www.geocities.com/SiliconValley/
6701/mailchk.htm](http://www.geocities.com/SiliconValley/6701/mailchk.htm),
free [597]

Mail Spy 1.1
www.saberquest.com,
free [598]

MailW@tch 1.12
www.deadsys.com/sw/mw.html,
shareware, \$24.00 [599]

NewMail 2.1
[home.eunet.no/~khunn/newmail
html](http://home.eunet.no/~khunn/newmail.html),
shareware, \$10.00 [600]

Phantom 0.37
[www.exepr.com/cnbrand/
phantom.htm](http://www.exepr.com/cnbrand/phantom.htm),
free [601]

POPit Mail Notifier 1.73
www.Pro-Pro.com/POPit.htm,
shareware, \$10.00 [602]

WinBiff 3.9
[www.pacnegr.com/winbiff/
winbiff.htm](http://www.pacnegr.com/winbiff/winbiff.htm),
shareware, \$12.00 [603]

Interface

★
MailCheck is part of the Auto-Bot scheduling program, and you must set up e-mail retrieval manually

★★★★★
CheckMail tries to configure itself using your browser settings, but it doesn't recognize IE4

★★★★★
CheckPOP installs itself on the C drive. It searches for installed e-mail programs and lets you choose among them

★★★★★
e-Mail Notify's tray icon displays the number of waiting messages in a small, dynamically drawn box

★
EMailR32 sits on both the taskbar and the tray

★★★★★
ESP Mail Check uses a variety of tray icons to convey status. If messages are waiting, it displays the count

★
JustPOP3 has many powerful features, but the interface is poorly organized, and the online help is mostly unhelpful

★★★★★
Lydia's interface is well organized. Lydia can't configure itself, but online help is available

★★
Though well organized, MailAlert's interface contains small flaws. For example, the Help feature doesn't work.

★★★
Mail Checker's main dialog uses a hard-to-control slider for specifying interval preference

★★★★
Mail Spy can't configure itself, but there is online help. The tray icon changes when new e-mail is detected

★
The interface is disorganized, and many controls are hidden in right-click menus. The tray icon changes for new mail

★★★★
The interface is mostly well organized, and there is online help. You can view headers only as a notification option

★
Phantom's tray icon does not have a context menu. You must perform all tasks from the main window

★★★
Though written for Windows 95 and NT 4.0, POPit does not support long file names

★★
WinBiff's tray icon doesn't change during checking, and you must manually set up the message count as a tool tip

Monitoring features

★★
MailCheck can monitor multiple POP3 e-mail IDs on different schedules. It can't display headers

★★★★★
CheckMail can monitor an unlimited number of e-mail IDs. It offers full dial-up support and the ability to preview headers

★★★★★
CheckPOP can monitor only a single e-mail ID. Its display of waiting message headers includes message sizes

★★
e-Mail Notify can monitor only one e-mail ID. It offers dial-up support and lets you launch the e-mail client of your choice

★★
EMailR32 can check an unlimited number of e-mail IDs but can't launch a mail client

★★
You can monitor only one e-mail ID, but the POP3 port is configurable. There is no dial-up support

★★★★★
JustPOP3 can check an unlimited number of e-mail IDs and lets you set each to a different port

★★★★★
Registered users can monitor up to ten e-mail IDs. Lydia can't launch an e-mail client, but it can display headers

★★★★
You can monitor multiple mailboxes by launching multiple instances. The program can display headers

★
Mail Checker can monitor only one mailbox. It can't display headers or launch an e-mail client

★★★★
You can monitor only one mailbox, but the port is configurable. You can't view headers, but you can launch your e-mail client

★★★★
MailW@tch can monitor any number of mailboxes and set the port number and WAV notification file for each

★★★★
NewMail can monitor only one e-mail account, and it can't display headers. There is dial-up support

★★
Phantom can monitor multiple e-mail IDs. It has no dial-up support. Phantom displays headers

★★★★★
POPit can monitor up to ten e-mail IDs with fully independent configurations. It has configurable ports as well

★★★★
You can monitor multiple IDs by launching multiple instances. WinBiff displays message headers

Notification features

★
MailCheck has a tray option, but the tray icon doesn't change when you have mail

★★★★★
Notification options are too numerous to list here. CheckMail will beep, change its tray icon, and more

★★
Notification is via a WAV file, a message box, a flashing tray icon, or the launch of an e-mail client

★★
e-Mail Notify displays the waiting-message count on its tray icon but doesn't update when messages are retrieved

★
Notification is through a message box and optionally a WAV file

★★★★★
ESP Mail Check's tray icon displays the number of waiting messages as a tool tip or icon

★★
The tray icon doesn't change while checking. But if e-mail is waiting, the icon displays the waiting-message count

★★★
The tray icon's tool tip shows only the waiting-message count if you've retrieved headers

★
For notification, MailAlert will beep, play a WAV file, execute a program, or pop up the header window

★
Notification is always by message box, with an optional beep. The tray icon doesn't change to indicate status

★
For new-mail notification, Mail Spy will play a sound, launch an application, or display a message box

★★★★
To notify, it can play a sound, change the tray icon and tool tip, and display message headers or a message box

★★
NewMail notifies by changing the tray icon and tool tip. It can also play a WAV file, display a message, or launch a program

★
Notification is by WAV file only. The tray icon tool tip displays the number of waiting messages

★★★★★
Each e-mail ID has its own tray icon, which is animated during checks, then displays the waiting message count

★★★★
Notification is done by a WAV file. You can set a separate WAV file for each filter. The tray icon shows waiting mail

Advanced features

★★
You can use a password to control access to MailCheck's main window, but the password is displayed as plain text

★★★★★
You can flag certain e-mail IDs as important and play a WAV or AVI file as notification

CheckPOP has no advanced features

★★★
You can prompt for a password at start-up or in view-and-delete mode or spawn a program when e-mail is received

EMailR32 has no advanced features

★★★★
You can launch and then send keys to your e-mail client, which lets you automatically pick up waiting mail

★★★★★
JustPOP3 can send and read e-mail internally as well as launch your e-mail client. It has extensive filtering options

★★★★
Lydia can send quick messages, as well as retrieve the first few lines of messages received

★★★★★
MailAlert has extensive filtering options, and the notifications work correctly. There are also scheduling options

Mail Checker has no advanced features

Mail Spy has no advanced features

MailW@tch has no advanced features

NewMail has no advanced features

★★★★★
A filtering option lets you scan for keywords in the e-mail headers and automatically delete messages from specified IDs

★★★★★
A tray menu item lets you send quick messages. You can retrieve entire e-mail messages and delete or reply to them

★★★★
WinBiff can monitor many message sources in addition to POP3, including cc:Mail, Lotus Notes, and Microsoft Mail

EATEN by the BROWSERS?



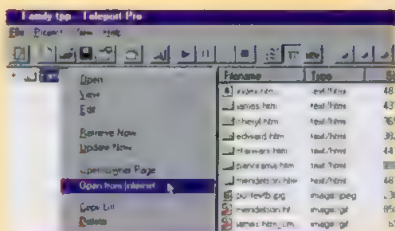
In the last few years, exciting and thriving markets for browser utilities have emerged and then virtually disappeared when Microsoft and Netscape added similar functionality to their new versions. Are you better off today than you were yesterday? Here, we look at five examples. By Edward Mendelson

OFF-LINE BROWSERS

Glory days: *PC Magazine*

reviewed 15 off-line browsers in our issue of April 8, 1997.

InContext FlashSite 1.01 and Teleport Pro won our Editors' Choice.



Teleport Pro organizes your downloads.

The best of what's left: **Teleport Pro 1.25** (\$40 street) remains the best-implemented tool for bringing a remote Web site to your disk for off-line browsing. Downloaded sites are stored in separate folders for easy management, and you can choose whether to download specific file types, Java applets, or only pages that contain specified search terms. (Tennyson Maxwell, www.tenmax.com.) [659]

WebSnake 1.23 (download, \$29.95) closely matches Teleport Pro in interface and functions and adds a feature that extracts all e-mail addresses from remote sites. The program suffers from interface problems,

though. Its tree-structured file list displays anchors within downloaded files; but when you click on an anchor, an error message tells you, wrongly, that the file wasn't downloaded.

(Anawave, www.anawave.com.)

[660]

The verdict: If all you want is to download a site for off-line viewing, the browsers get the job done. But for easy management, distribution, and customized down-

loads, Teleport Pro remains indispensable.

PUSH CLIENTS

Glory days: *PC Magazine* reviewed 11 push clients in our issue of February 18, 1997. AirMedia Live Internet Broadcast Network 1.0 and The PointCast Network 1.2 won our Editors' Choice.

The best of what's left: **BackWeb 3.0**, a free download, brings news and weather to your desktop. Some info comes as a ticker-tape display; other news arrives in *flashes* that slide onto your desktop, as screen savers or desktop wallpaper, or as full-text reports that display in your browser window.

Now positioned for use in intranets, BackWeb doesn't try to compete with PointCast and the browsers, but it's still available to end users who want information from providers of publicly available BackWeb content. (BackWeb Technologies, www.backweb.com.) [661]

Available as a free download, **PointCast Network 2.0**, the most popular standalone push client, brings a vast range of news sources to the desktop either through a ticker tape, a screen saver, or its own application window. PointCast is elegant and easy to use despite the distracting animated ads. You can browse the Web inside the application window using PointCast's native browser or the browser component of IE. (PointCast Inc., www.pointcast.com.) [662]

The verdict: PointCast is the push client of choice if you happen to like its channel mix, but for most IE users, IE's channels and Active Desktop option (which includes the PointCast Network channel) will provide all the "push" they need. Netscape users who don't want to

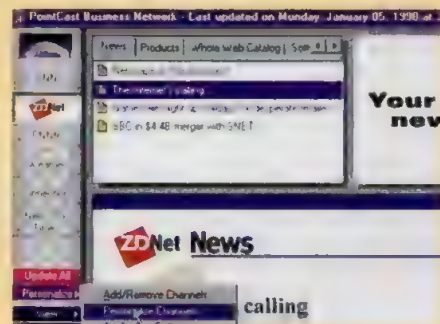
wrestle with the clumsiness of Netcaster may want PointCast if they want push content.

COLLABORATION UTILITIES

Glory days: *PC Magazine*

reviewed four Internet collaborative tools in our issue of October 8, 1996. Microsoft NetMeeting won the Editors' Choice.

The best of what's left: **Internet Conference Professional 2.1a** (download, \$99) is an elegant, feature-rich whiteboard and voice-conferencing package that uses OLE to embed documents so they can be opened on remote systems. Easy-to-use toolbars for screen capture and highlighting, easy import of Microsoft Office documents, and fast performance make the product a pleasure to use. The interface consists of a



Create personal channels with PointCast.

and manipulated, you may want to try one of the following three floating-toolbar utilities for even more control. Each provides the familiar back, forward, refresh, and home functions but also adds some useful surfing companions.

- For Netscape Navigator, Stephano Barbato offers **Flying Toolbars 4.01** (\$16), a highly configurable auto-hiding set of browser function buttons that reappears as mouse-

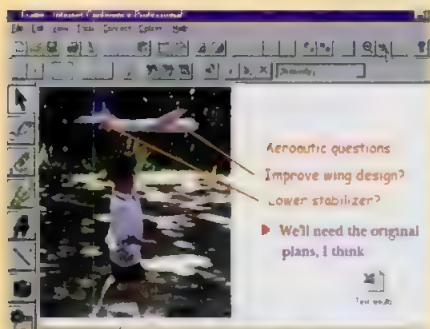
over text at the top or bottom of the screen. User-defined preferences include the order in which search engines are used by the Search button (you can change the default engine by right-clicking the search box and selecting from your list) and specifying programs to auto-launch with Flying Toolbars. (Stephano Barbato, www.webcom.com/flyingtb.) [658]

- **Internet Copilot 97** (\$29.95) works with

either IE or Netscape Navigator and combines a similar set of browser functions into a floating vertical toolbar (which, unfortunately, moves behind other programs when you switch programs or click to a new page). The search function includes a complex tree of topics (provided by Yahoo!) and from the Rolodex®-like Cards utility, you can open a phone dialer or e-mail box

multipage whiteboard with toolbars at the top and side, plus a pop-up chat window that can be closed when you don't need it. (VocalTec, www.vocaltec.com.) [665]

Rendezvous 2 (download, \$19.95 for a client, \$200 and up for servers) offers whiteboard, chat, and access to IRC channels but no voice or real-time video—although screens can be captured from a video camera and dis-



ICP is a pleasure to use.

played on the whiteboard. Application files can be sent in the form of icons that can be opened on remote systems. The client is available on all major platforms as well as for Java; the Windows version, tested by PC Labs, seems slow and awkward compared with NetMeeting. (Visualtek Solutions Inc., www.visualtek.com.) [666]

The verdict:

Microsoft NetMeeting, with its videoconferencing, multipage whiteboard, and slick interface, is an attractive

alternative to standalone products, although its audio and video feature can be used by only two conferees at a time. Also, a serious security weakness lets conferees delete files on your system if you use application sharing.

NEWS READERS

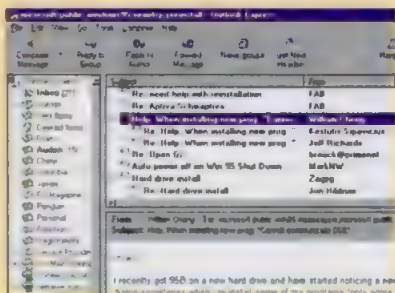
Glory days: PC Magazine reviewed nine newsgroup readers in our issue of October 8, 1996.

Gravity 1.0 and Internet in a Box

2.0 won the Editors' Choice awards.

The best of what's left: A powerhouse among news readers, Forté's **Agent 1.5** (download, \$29) offers powerful filter and watch features that

automatically hide or download newsgroup messages according to your specification. A customizable three-pane interface displays newsgroups, headers, and message texts, all under a complex toolbar, but most features are



Outlook Express's news interface wins out.

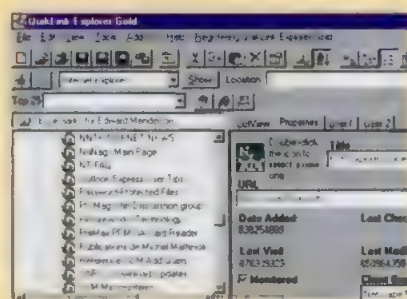
accessible with a single keystroke.

Agent is the only news reader other than Microsoft Outlook Express that can access the Microsoft Network news servers; it also doubles as an e-mail client. A freeware sibling,

Free Agent, has a similar interface but fewer features. (Forté Inc., www.forteinc.com.) [667]

Gravity 2.0 (download, \$39.95) has filter and watch features as strong as those in Agent. It has an easier-to-navigate interface but lacks Agent's built-in e-mail client and support for Microsoft Network newsgroups. Like Microsoft Outlook Express, Gravity lets you switch news servers without exiting the program. Toolbars and menus are easy to navigate, and multipart binary messages are automatically recombined and downloaded. (Anawave, www.anawave.com.) [660]

The verdict: Go with Microsoft Outlook Express if you're a casual follower of newsgroups. Both it and Netscape's built-in news reader access multiple servers and support rudimentary message filters, but they can't match the elaborate filtering rules and binary-attachment handling of third-party readers, which we recommend for power users.



QuikLinks offers options aplenty.

BOOKMARK UTILITIES

Glory days: PC Magazine reviewed ten Internet organizers in our issue of May 14, 1996. NetBuddy and Surfbot 2.0 were the Editors' Choice winners.

The best of what's left: Quik-Link Explorer Gold 3.0 (download, \$40) is the ultimate in bookmark organizers. A tree-structured list of bookmarks appears in an Explorer-type Window; the URL displayed in the browser can be added as a bookmark, and individual bookmarks can be specified to launch either IE or Netscape. (QuikLink Software, www.quiklinks.com.) [668]

WebQuick 1.8 (download, \$39.95) keeps track of all pages you've recently visited, sorts them into a tree-structured pop-up list, and lets you check for updates. (WebCo International Inc., www.europasoft.com.) [669]

The verdict: Separate bookmark utilities are power tools for users who need to manage hundreds of links. Most users will find all the tools they need in the browsers.

to contact anyone in the list. You can also schedule and manage file transfers. (Logic Pulse Software, logicpulse.com.) [663]

• As straightforward as its name suggests, **Nuthin' But Net 1.0** (free) is a plainly designed auto-hiding toolbar for IE4 with only basic functionality. The toolbar does, however, include a statistics function that keeps track of your time

spent online. (PAKSoft Productions, users.aol.com/napkat/paksoft.) [664]

WEB OUTLINES

• Not every Web site has mastered the art of seamless navigation. **WebTurbo** makes browsing on the Web more efficient by generating surfable outlines—based on your queries—that appear in a frame next to your Web browser. The clickable sum-

maries let you jump directly to any section of a Web page, bypassing the sections you don't want to view. WebTurbo, which is free, works with either IE or Netscape Navigator. (NetMetrics Corp., www.webturbo.com.) [670]

• **Personal Crawler** goes even farther than WebTurbo in summarizing Web sites. It enables you to view all the elements that make up a Web page before you look at

FTP Utilities

Many users need more than the rudimentary FTP support built into today's browsers. These 32-bit Windows utilities—all recently updated—support uploads, downloads, and more. (The numbers in square brackets can be selected at www.pcmag.com/infolink for product information.) By Sheryl Canter

★★★★★—Best

AbsoluteFTP 1.0 Beta 6
www.landbyte.com
shareware, \$29.95 [604]

AutoFTP 1.1a
www.primasoft.com
shareware, \$15.00 [605]

BulletProof FTP 1.03
www.bpfip.com
shareware, \$29.95 [606]

EDITOR'S CHOICE

ByteCatcher FTP 1.04
www.save-it.com
shareware, \$17.50 [607]

Crystal FTP 1.0
www.casdk.com
shareware, \$29.00 [608]

CuteFTP 2.0
www.globascope.com
shareware, \$34.95 [609]

Drag & File 4.16c
www.canyonsw.com
shareware, \$35.00 [610]

eFTP Explorer 1.10
www.edisys.com
shareware, \$19.95 [611]

File Dog 1.31
www.edgpub.com
shareware, \$39.00 [612]

FTP Explorer 1.00.10
www.ftpx.com
shareware, \$30.00 [613]

FTP Express 1.5
www.intellisys-mn.com
shareware, \$24.95 [614]

FTP Voyager 5.0.1.0
www.rhinoast.com
shareware, \$29.95 [615]

Internet Neighborhood 1.1.33
www.knowareinc.com
shareware, \$26.50 [616]

LeapFTP 2.2
www.leapware.com
shareware, \$20.00 [617]

RftpPro 1.1
rftp.com
shareware, \$25.00 [618]

WS_FTP Pro 4.50
www.ipswitch.com
shareware, \$37.50 [619]

Interface

★★★★★

AbsoluteFTP offers multiple, simultaneous connections and transfers. The Explorer-style interface lets you drag and drop files.

★★★★

AutoFTP offers an easy interface, online help, and a wizard-style assistant to guide you through the transfer process.

★★★★

The four-pane interface offers three drag-and-drop-enabled windows—local, file-queue, and remote—and the server log.

★★★☆☆

The local and remote directory trees are displayed side by side, with a large-font log along the top.

★★★★

The server-log color scheme is very hard to read. Favorites from the hierarchical site database can be placed on the toolbar.

★★★★

The interface on this utility is dated. You must sort directories through menu options and use a dialog to rename files.

★★★★

Basically a file management utility, Drag & File adds FTP access. The dual-pane view lets you drag files and directories.

★★★★

The interface offers a tree view of FTP sites arranged under a single node. Site data is fully cached. There is drag-and-drop.

★

File Dog's interface is chaotically designed, and the online help, though extensive, is unhelpful.

★★★★★

The program's Explorer-like interface supports drag-and-drop. Commands are queued and executed in the background.

★★★★★

FTP Express's Explorer-like interface supports simultaneous multiple connections and transfers and drag-and-drop.

★★★★★

FTP Voyager uses an Explorer-type interface to display local and remote directories.

★★★★

IN is a shell extension to Explorer, adding a node for FTP servers. Changes or bugs in Windows can bring your system down.

★★★★

Interface components are not always clearly labeled, and the help file is inadequate in places.

★★

The interface is a tiny properties dialog box that you can't enlarge. Many options are hidden in right-click menus.

★★

The interface is dated and clumsy compared with its newer competition. Many options are hidden in right-click menus.

File management

★★★★★

You can resume interrupted downloads, associate file extensions with transfer modes, and transfer entire directories.

★☆☆☆☆

You can't transfer or delete directories. When you choose a remote starting directory, AutoFTP loads the root first.

★★★★

Though you can connect to only one site at a time, you can resume automated downloads.

★★★☆☆

You can resume interrupted downloads. You can't rename or delete directories unless they're empty.

★★★★

You can resume interrupted downloads. A site-specific queue lets you batch downloads. You can transfer directories.

★★★★

You can drag and drop to transfer directories, resume interrupted downloads, and create custom FTP commands.

★

You can't transfer or delete directories unless they're empty. The highlighted and active items are sometimes out of sync.

★

You can't rename or delete directories unless they're empty. You can't resume interrupted downloads or view the server log.

★

File Dog is mainly an FTP scheduling utility with a rudimentary module for manual FTP. It can't create remote directories.

★★★★★

FTP Explorer transfers files in the background and can queue transfers among multiple servers.

★★★★

Each site is stored on-disk as a document with the file structure visible during saving. You can transfer files.

★★★★★

You can create, rename, and delete entire directories. You can't navigate up from the starting directory.

★★★☆☆

FTP sites are stored as items under the IN node. IN has few options and numerous minor glitches.

★★★★★

Though you can connect to only one site at a time, you can resume aborted downloads. You can transfer directories.

★★

You can resume aborted downloads. You can't transfer or delete entire directory structures. There are few options.

★★★★

You can transfer and rename populated directories, but you can delete only empty directories.

Unattended operation

★★★★★

There are no features for unattended operation.

★★★★

You can create a list of files to transfer, then associate the list with a schedule. AutoFTP can disconnect after transferring.

★★★★

Command-line options let you schedule downloads from multiple sites using scheduling software.

★★

Downloads can run unattended once begun. ByteCatcher supports auto-reconnect and auto-shutdown.

★★★★

There are no features for unattended operation.

★★★★

There are no features for unattended operation.

★★★★

There are no features for unattended operation.

★★★★

Files to be transferred are moved to a queue, from which transfers can be stopped and restarted at a later time.

★★

File Dog offers a scheduler that lets you run single or recurring jobs but has numerous glitches and anomalies.

★★★★

There are no features for unattended operation.

★★★★

There are no features for unattended operation.

★☆☆☆☆

There are no features for unattended operation, but integration with Download Butler will be offered in the next release.

★★★★

There are no features for unattended operation.

★★★★★

An easy-to-use though inadequately documented scripting feature gives you a powerful tool for unattended operation.

★★★★

You can use a command-line mode with a utility to schedule unattended file transfers.

★★★★★

WS_FTP Pro has a command-line syntax that lets you connect, transfer, and disconnect.

Advanced features

★★★★★

There are no advanced features.

★★★★★

There are no advanced features.

★★★★★

Find File provides wild-card searching of remote sites. Leech mode reconnects to sites that disconnect after a set limit.

★★★★★

There are no advanced features.

★★★

You can create bookmarks for your local system and remote sites. A compare option shows directory differences.

★★★★

A directory-comparison feature facilitates updates. You can set bookmarks for the remote sites you visit.

★★★★

There are no advanced features.

★★★★

You can create a watch list of files and quickly determine if they're outdated. Update files with two mouse clicks.

★★

There is a mirroring facility for synchronizing directories. You must select the master directory in a separate dialog box.

★★

There is menu access to the Windows archive utility, IpArchie.

★★

Each remote site can have up to ten bookmarks, and you can create a list of favorite download folders.

★★★★★

A feature named Find File lets you search remote sites. You can synchronize local and remote folders.

★★★★

There are no advanced features.

★★★☆☆

You can create custom commands.

★★★★

There are no advanced features.

★★

You can apply filters to remote directories and append downloaded files.

the page. Personal Crawler conducts searches within a Web site or a predefined list of sites and lets you view a site by its components, such as images, movies, and links. Then, as with WebTurbo, you can jump directly to the element you want with a mouse click. Providing even more detail, Personal Crawler lets you create a Java-based site-navigation map with a single click. (VCI, www.vci.co.il) [671]

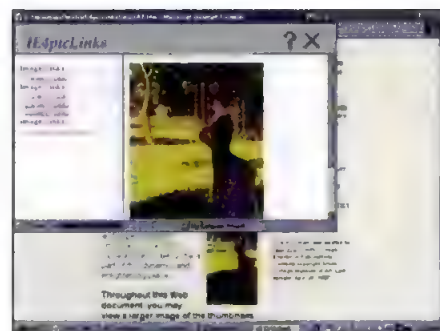
If you love utilities, head for our Web site to check out **INTERACTIVE SUMMARIES** of features, download demos, and www.pcmag.com/features/utilities98/ join in **DISCUSSIONS**. We'll also have animated **WALK-THROUGHS** of the best products.

of all your system's bookmarks and then export them back to your browsers. You can create custom lists to export to individual browsers. (Ziff-Davis Inc., www.pcmag.com.) [674]

WEB GRAPHICS MANAGERS

The Web exploded in popularity a few years ago because, unlike its text-based Internet predecessors, it is a graphical medium. To take advantage of that, these utilities help you find images on Web pages and view them.

- Designed to work like an auto-pilot for browsing the Web, **WebZinger** (\$44.95) locates Web sites by topic, analyzes the sites, and then downloads and displays the results as a slide show. WebZinger uses the parameters you set up to analyze the sites and reduces redundancy. The slides may be text-only or text and pictures. During playback you can click on a slide to go to the live



IE4PICLINKS strips out all that pesky text and lets you view what you came to see.

Web site. (Imaginon, www.imaginon.com.) [672]

- IE4picLinks 1.0** (\$19.95) is useful for navigating an image-driven site, such as a museum exhibition. It locates all the links to GIF and JPEG images from whichever page you're visiting and organizes the links for consolidated viewing. Just place your cursor over text and right-click to choose IE4picLinks from the menu; the utility then displays its own two-pane window showing the link and the image. (Z-to-Z, 207.201.233.107/ztoz.) [673] **PC**

SYNCHRONIZE BOOKMARKS

If you switch from Navigator to Internet Explorer, you get a list of your imported bookmarks. But what happens if you switch from IE to Navigator or use both and make changes in both? You can't work with one set of bookmarks without a lot of repetitive work unless you use **SyncURLs**, a *PC Magazine* utility. SyncURLs imports your bookmarks into a single library where you can create a file

ADVERTISEMENT

IN THE CHANCERY COURT OF THE STATE OF DELAWARE
IN AND FOR NEW CASTLE COUNTY

BRANDON COX, by EDWARD COX,
his natural guardian and next friend,
JOHN KREPS, and MARK
SOLOMON, M.D.,
Individually and On Behalf of All Others
Similarly Situated,

Plaintiffs,

v.

IOMEGA CORPORATION,

Defendant.

Civil Action No.:
15809

SUMMARY NOTICE OF PENDENCY OF CLASS ACTION AND HEARING ON PROPOSED SETTLEMENT

TO: ALL PERSONS WHO PURCHASED IOMEGA ZIP®, JAZ®, AND
DITTO™ DRIVES BETWEEN JULY 16, 1994 AND SEPTEMBER 1, 1997

YOU ARE HEREBY NOTIFIED that the Plaintiffs and Iomega in the above-captioned Class Action lawsuit have entered into an agreement to settle this Class Action.

PLEASE BE FURTHER ADVISED that pursuant to an Order of the Court of Chancery of the State of Delaware, dated January 26, 1998, a hearing will be held on April 3, 1998 at 11:00 a.m. at the Daniel L. Hermann Courthouse, 1020 North King Street, Wilmington, Delaware for the purpose of determining (1) whether the proposed settlement of the Class Action under the terms set out in the Stipulation of Settlement of Class Action on file with the Court, should be approved by the Court as fair, reasonable and adequate; (2) whether the Class Action should be dismissed on the merits and with prejudice as against Iomega pursuant to the terms of the Stipulation; (3) whether the Class as defined in the Stipulation of Class Action should be permanently certified; and (4) the reasonableness of the application of the plaintiffs' counsel for an award of attorneys' fees and/or reimbursement of costs and expenses incurred in connection with the Class Action.

If you purchased an Iomega Zip, Jaz or Ditto drive between July 16, 1994 and September 1, 1997, your rights may be affected by the settlement of the Class Action.

If you have not received a detailed Notice of Pendency of Class Action and Hearing on Proposed Settlement, you may obtain copies by calling 1-888-229-0971, or by downloading said Notice from Iomega's World Wide Web page at <http://www.iomega.com>.

Please do not contact the Court or the Clerk's office.
Dated: January 26, 1998

BY ORDER OF THE COURT OF CHANCERY OF
THE STATE OF DELAWARE

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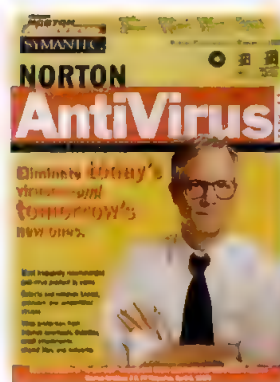
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OS/2, WINDOWS NT, WINDOWS 3.x, & DOS

do TASKS in other OSs

Windows 95 is the leader on desktops, but there will always be other OSs. Here are some utilities for them. By Brian Proffitt and M. David Stone

IN THIS REVIEW



OS/2 UTILITIES

Make the most of your OS/2 system. With these handy products, you'll work faster and smarter. By Brian Proffitt

ANTIVIRUS

• **Dr Solomon's Anti-Virus Toolkit for OS/2** (\$125), from Dr Solomon's Software, is still one of the easiest to use and most frequently updated virus checkers on the market. (888-377-6566, www.drsolomon.com.) [561]

• **IBM AntiVirus** (\$49.95) is quite dependable, although a touch slow. The documentation is an excellent encyclopedia on viruses. This is one virus scanner we have never seen give a false positive. (800-742-2493, www.av.ibm.com/IBMAnti-Virus.) [564]

• Network Associates claims 100 percent detection for **McAfee VirusScan** (\$49). That might be a stretch, but the program is extremely thorough. The company pushes updates to you electronically as they are released, so you

are always up to date. Updates are free for the life of VirusScan. (408-988-3832, www.networkassociates.com.) [545]

BACKUP

• Computer Associates' **ARCserve** (\$295) uses good tape cataloging to let you easily locate any file you need to restore. Bootable floppy disk disaster recovery let us switch to a new hard disk and be back where we were quickly and easily. (800-243-9462, www.cai.com/cheyenne.) [565]

• Computer Data Strategies' **Back Again/2** (personal, \$19.95; professional, \$149; enterprise, \$299) strikes a great balance, combining broad drive support with a good interface and solid reliability. (800-284-4156, www.cds-inc.com.) [621]

• MSR Development Corp.'s **BackMaster** (\$99.95) still doesn't have as broad support for SCSI drives as some competitors, and the program has the occasional quirk, but it generally does a good job on



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For more information on a given utility, find the number in square brackets at the end of the product's review, then choose that number at www.pcmag.com/infolink.

All prices are list unless otherwise indicated.

• **Seagate Backup Exec for OS/2 Warp** (\$99), from Seagate Software, has a drag-and-drop interface that integrates smoothly with the Workplace Shell. (800-327-2232, www.seagatesoftware.com.) [529]

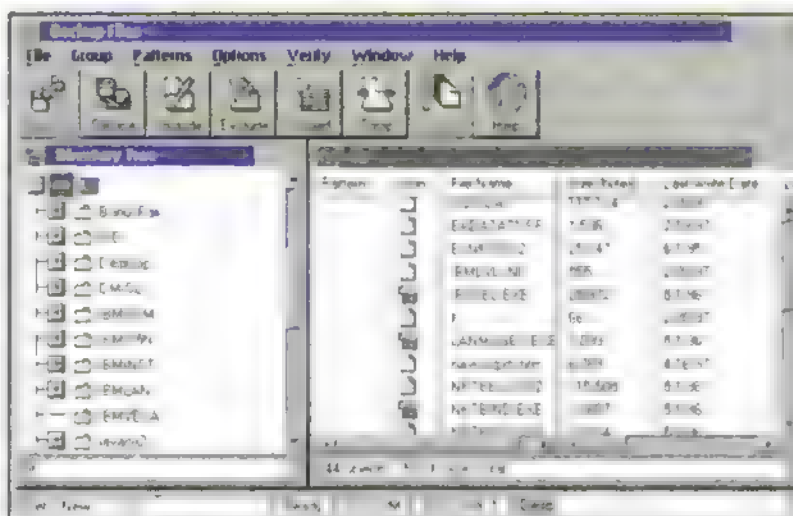
DESKTOP MANAGEMENT

- DevTech's **DeskMan/2** (\$99.95) lets you set up several distinct desktop configurations, so people who share a machine can have their own desktops. Those desktops are easier to customize, too. (803-790-9230, www.devtech.com.) [624]
- Pinnacle Technology's **Desktop Observatory** (\$199) combines desktop management with security, allowing customized layouts with password-controlled file access. (800-525-1650, www.pinnacletech.com.) [625]
- **Object Desktop** (\$89.95), from Stardock Systems, combines multiple desktops, archive management, and system monitoring and tuning tools into one relatively straightforward package. Power users will love it. (888-782-7362, www.stardock.com.) [626]
- Syntegration's **The Secure Workplace** (standard, \$79.95; professional, \$120) offers secure access to each object on the desktop. The professional version takes security to the U.S. government's C2-level standard. (800-464-9450, www.primenet.com/~syntegrn.) [627]
- **Traveling Workplace** (\$69.95), also from Syntegration, provides desktop configuration capture and restore, including copying desktop layouts to other systems. You can also switch among multiple layouts on one workstation, so each user can have a customized setup. [627]

DISK MANAGEMENT

- **SofTouch Systems' GammaTech Utilities** (\$99) is a handy collection of disk utilities. We've had positive experiences with SofTouch Systems' support group, a plus for this and all STS products. (800-944-3028, www.softouch.com.) [628]
- **Spectre Software Support's Graham Utilities** (\$49; with documentation, \$69), always an extremely rich set of disk management routines, now provides more support for FAT partitions in addition to its HPFS support. It also provides easy backup and restoring of the extended attributes OS/2 uses to store additional information with each file. (319-868-7656, www.netins.net/showcase/spectre.) [629]

- **PowerQuest's PartitionMagic (\$69.95)** isn't strictly an OS/2 utility, since it runs as a DOS program. But this truly magical disk partition-maintenance program supports HPFS partitions, making it invaluable for OS/2 users. (800-379-2566, www.powerquest.com.) [630]
- **Phoenix/2 (free)**, by Joe DiAdamo, is a simple file undelete utility that works on both FAT and HPFS partitions. It can recover deleted files that have not yet been



BACK AGAIN/2 offers an easy-to-use interface and solid reliability.

written over. And the price can't be beat.
(<http://hobbes.nmsu.edu>.) [631]

INTERFACE

- **SofTouch Systems' FileStar/2** (\$59.95) brings the familiar two-window file manipulation interface to OS/2. (800-944-3028, www.softouch.com.) [628]
- **40S2** (\$69.95), from JP Software, provides an alternative to the OS/2 command shell for those accustomed to a command

prompt interface. Functions such as color-coded directory listings that highlight programs of specific types, command completion, and access to a command history list make the 4OS2 interface more efficient than the Workplace Shell for some functions. (800-368-8777, www.jpsoft.com.) [632]

- **Hamilton Laboratories' Hamilton C-shell** (\$350) gives OS/2 users the Unix command interface and some enhancements. (978-440-8307, www.hamiltonlabs.com.) [633]
- **JP Software's Take Command** (\$69.95) combines all the features of 4OS2, adds some more, and puts them into a Workplace Shell program for easy cut-and-paste with other windows. Pull-down menus and dialog boxes simplify working with standard command line functions. Those who can't give up their command prompt need this. (800-368-8777, www.jpsoft.com.) [632]

SYSTEM

- **SofTouch Systems' The GammaTech Power Pack** (\$69.95) contains editors for extended attributes and initialization (.INI) files, a HotKey manager you can use to set up keyboard macros, and a screen saver. (800-944-3028, www.softouch.com.) [628]
- **Stardock Systems' OS/2 Essentials** (\$49.95) offers performance and resource monitoring tools as well as a huge collection of shareware, freeware, and FixPaks. (888-782-7362, www.stardock.com.) [626]
- **Performance Plus** (\$39.95), from Clear & Simple, is a combination of monitors and tuning utilities to help optimize your system. The manual is a treasure trove of tips and suggestions. (860-658-1204; fax, 860-651-0354; www.clear-simple.com.) [500]
- **WallyWare's PM Patrol** (\$29) is a shareware collection of system-monitoring tools that let you determine

where your system resources are being used. (<http://homepage.interaccess.com/~wally>.) [635]

- **Stardock Systems' Process Commander** (\$69.95) is at its best when your system isn't. If your system appears hung, pressing Ctrl-Alt-Del causes Process Commander to open a full-screen command prompt, from which you can try to clear the hung process using the included kill utility. There are also process-monitoring functions, including the ability to change the priorities of running threads. (888-

782-7362, www.stardock.com.) [626]

- BMT Micro's **RoboJob** (\$49) is a flexible job-scheduling program, supporting the launch of OS/2 graphical or text-based programs, as well as Windows or DOS programs. There is good logging, so you can verify the successful execution of your jobs. (800-414-4268; fax, 800-346-1672; www.bmtmicro.com.) [636]

- Petree Technologies' **ScheduleMate** (\$149) enabled us to schedule a variety of programs and command files in as complicated a time pattern as we could imagine. It lets you automate processes for overnight execution, reducing system load during peak hours, and also schedule those things you want to do every week but don't want to have to remember. (770-667-5663, www.petreetech.com.) [634]

- SofTouch Systems' **UniMaint** (\$79.95) is an extremely rich set of utilities, specializing in configuration, backup, and maintenance of specialized OS/2 areas, such as extended file attributes and initialization (.ini) files. (800-944-3028, www.softouch.com.) [628]

WINDOWS NT

Build even more power into Microsoft Windows NT with these productivity-enhancing solutions. By Brian Proffit

ANTIVIRUS

- Dr Solomon's **Anti-Virus Toolkit for Windows NT** (\$125), from Dr Solomon's Software, balances speed, reliability, and ease of use. Updates are not available online. (888-377-6566, www.drsolomon.com.) [561]

- IBM **AntiVirus** (\$49.95) provides documentation that covers viruses thoroughly. The scanner is equally thorough. Usability, however, isn't necessarily the greatest, nor is the speed. (800-742-2493, www.av.ibm.com/IBMAntiVirus.) [564]

- Network Associates' **McAfee VirusScan** (\$49) is the category's price/performance leader. It is extremely thorough, and the use of push technology to get updates to your workstation automatically keeps your virus signature file up to date. (408-988-3832, www.networkassociates.com.) [566]

- Symantec Corp.'s **Norton AntiVirus** runs as a Windows NT service and checks the Symantec Web site periodically for updates, downloading them automatically. (800-441-7234, www.symantec.com.) [567]

BACKUP

- Computer Associates' **ARCserve for NT Workstation** (\$149) is a surprisingly complete subset of Computer Associates' server backup product. ARCserve includes disaster-recovery automation as well as virus scanning to help ensure clean data is stored. Simple wizard-based configuration and alert-based notifications bring enterprise power to this desktop package. (800-243-9462, www.cai.com/cheyenne.) [565]

- Novastor Corp.'s **NovaBack+** (\$49.50) is priced attractively. NovaBack+ offers very high-speed backups and adds a virus scanner to ensure that only clean files are saved. It supports more than 400 varieties



UNIMAIN provides a rich set of tools for managing your OS/2 system.

of tape drive, including auto-changers, and includes boot-disk disaster recovery. (805-579-6700, www.novastor.com.) [531]

- **Replica Backup for Windows NT** (\$249), from Stac, offers the most painless way to do backups and restores of entire partitions and drives. It uses a low-level access technique to copy data without opening and closing files, so user access is never impaired by lockouts during replication. (800-522-7822, www.stac.com.) [637]

- Seagate Software's **Seagate Backup Exec for Windows NT** (\$695) has networkwide scheduling abilities. Tape files are compatible with the backup utility included with Windows NT and Microsoft Exchange Server. Reporting abilities are extensive. (800-327-2232, www.seagatesoftware.com.) [529]

- BEI Corp.'s **UltraBac for NT** (\$125) is the fastest Windows NT backup program we've used. BEI claims that UltraBac works with every device supported by the operating system. Software compression is included for smaller save sets, and an interesting option allows automatic defragmentation after backup is complete. (425-644-6000, www.ultrabac.com.) [638]

DESKTOP MANAGEMENT

- Pinnacle Technology's **Desktop Commander** (\$99) lets you configure desktop layouts by user, allowing both easy access and security. On a LAN, users' desktop layouts follow them wherever they log on. (800-525-1650, www.pinnacletech.com.) [625]

DISK MANAGEMENT

- Executive Software's **Diskeeper** (\$75) aids system performance by defragmenting your hard disk. It also monitors file usage and attempts to cluster the most frequently accessed data in the center of the disk, so the read/write heads can get to it as quickly as possible. Diskeeper runs in the background to keep the disk tuned, though in its

most aggressive configuration, it does affect system performance. (818-547-2050, www.execsoft.com.) [639]

- PowerQuest's **Partition-Magic** (\$69.95) isn't strictly a Windows NT utility, since it runs as a DOS program. But this truly magical partition-main-

tenance program supports NTFS and FAT32 partitions, making it invaluable for Windows NT users and for those migrating to or from the operating system. (800-379-2566, www.powerquest.com.) [630]

- Raxco Software's **PerfectDisk** (\$49) defragments your hard disk and tries to keep your most frequently accessed data close to the center of the drive for the shortest seek time. (301-527-0823, www.raxco.com.) [640]

INTERFACE

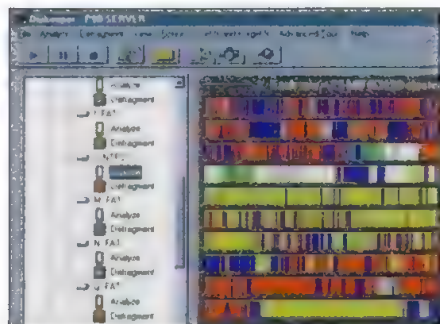
- Those still hooked on command lines will appreciate **4NT** (\$69.95), from JP Software. This utility provides new commands and new functions for existing commands. Batch files have useful new logic constructs, too. (800-368-8777, www.jpsoft.com.) [632]

- Hamilton Laboratories' **Hamilton C-shell** (\$350) offers the Unix command interface to Windows NT users, along with some enhancements. Most of our existing Unix scripts ran without modification. (978-440-8307, www.hamiltonlabs.com.) [633]

- Mortice Kern Systems' **The MKS Toolkit** (\$399) also brings the Unix utility set, including scripting, to Windows NT, plus lots of other handy programs in areas such

as file manipulation, desktop management, and even Web publishing. (800-265-2797, www.mks.com.) [641]

• **JP Software's Take Command/32** (\$69.95) takes all of the power of 4NT and puts it into a graphical window to provide greater ease of use and drag-and-drop flexibility with other programs. (800-368-8777, www.jpsoft.com.) [632]



DISKPARTER helps keep your Windows NT system tuned for peak performance.

SYSTEM

• **Symantec Corp.'s Norton Utilities 2.0 for Windows NT** (\$99.95) includes a collection of system monitors that are extremely flexible. The configurability of the utilities and their graphical representation are excellent, and the automatic updates downloaded from Symantec's Web site are a plus, too. The Speed Disk defragmentation program and UnErase file recovery programs add icing to the cake. (800-441-7234, www.symantec.com.) [503]

• **Petree Technologies' ScheduleMate** (\$149) enabled us to schedule a variety of programs and command files in as complicated a time pattern as we could imagine. It lets you automate processes for overnight execution, reducing system load during peak hours, and also schedule the procedures we wanted to take care of every week but did not want to have to remember. (770-667-5663, www.petreetech.com.) [634]

DOS AND WINDOWS 3.x

Whether you work in DOS or in a DOS box, these utilities can help you accomplish your goals. By M. David Stone

• **Another Change Directory** (free), from A. Merckens, is for those who like to move around their disks by giving Change

Directory commands at the command line. With ACD, you can type just the target directory name instead of the entire path. ACD finds the directory for you even if it's in another branch of the tree, on another disk, or on a network disk. If more than one directory matches the name or partial name you type, you get a pop-up list to choose from. There is no faster way to move around your system. (<http://peacock.gac.peachnet.edu/~giles/freedos.html>.) [642]

• **NoVaSoft's CMFile** (\$30) is the file manager of choice when you want keyboard control and conveniences like being able to see the contents of two directories at once. CMFile lets you view, edit, tag, delete, copy, move, rename, compare, and run files, change drives and directories, make new directories, and drop to a DOS command line. It even works in a DOS window in Windows 95, with full support for long filenames and the ability to launch Windows programs. (414-354-8699, <http://ourworld.compuserve.com/homepages/novasoft2>.) [643]

• **CMFloppy** (\$10), also from NoVaSoft, is three floppy disk utilities in one. The Duplicator reads a master disk once and makes up to 99 copies to formatted or unformatted floppy disks. The Formatter formats up to 99 disks, overwriting all data in the process. The Scanner lets you see all the data on a floppy disk—including data you can't otherwise read—by track, head, and sector. Any of these features is easily worth the full price. The three together are a bargain. [643]

• **JP Software's 4DOS** (\$69.95) is one of the more useful replacements for Command.com. In addition to extra commands, 4DOS supplies such conveniences as command line editing tools and new variations on standard commands. 4DOS can replace Command.com in Windows 95 as well.

If you like the idea of having extra commands available but prefer working from a GUI, consider **Take Command/16** for Windows 3.1 (\$69.95; with 4DOS, \$99.95), also from JP Software. The company describes Take Command as 4DOS with menus. (800-368-8777, www.jpsoft.com.) [632]

• **List** (free) and **List Enhanced** (\$99), from Buerg Computers and Software, are two extremes of a set of programs that range from a somewhat limited file viewer to a file viewer that can also navigate your disks; copy, move, delete, and print files; and even dial your telephone. Buerg also offers a wide range of other utilities, including **Quick Disk Reformatter**, which lets you quickly delete all files and directories from a floppy disk. You can download these additional utilities free for personal use or order the complete set on-disk for \$60. (707-769-5477, www.buerg.com.) [647]

• **Symantec Corp.'s The Norton Utilities** (\$80 street) was one of the first DOS utility packages. Now in Version 8.0 for Windows and DOS, it remains one of the most capable. Probably the most valuable feature in the original was Unerase, which was available long before DOS added Undelete. It's now of great value again, since Windows 95 has done away with Undelete. Version 8.0 includes the Norton Classic Utilities plus a replacement for Command.com, a set of programs for maintaining Win.ini and System.ini, and versions of Disk Doctor and Speed Disk that run in the background for continual file system repair and disk optimization. This is still the quintessential DOS utility package. (800-441-7234, www.symantec.com.) [503]

• **PKZip for DOS 2.04g** (\$47), from PKWare, is still the ZIP program many power users prefer for compressing files



CMFILE offers easy file management whether you work in DOS or Windows.

because of its command line convenience. (414-354-8699, www.pkware.com/pkz204g.html.) [645]

• You'll also want to consider InfoZIP's PKZip-compatible—and free—ZIP 2.2 and UnZIP 5.32. (www.cdrom.com/pub/infozip.) [646] **PC**

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Net Tools



Back Up Against Disaster

Network backup should be an essential element of any solid disaster recovery plan.

By Steve Rigney

When disaster strikes, it isn't picky about what data to take away. If your network, like many others, relies on NetWare and Windows NT to perform tasks important to your business, you need to find a solution for backing up data on both platforms. The division of labor between these two operating systems is becoming more commonplace now that Windows NT is quickly gaining market share as an intranet/application server whereas NetWare continues trying to hold onto its lead as the top file- and

print-sharing solution. In this roundup, we look at three of the most popular enterprise storage solutions for NetWare and Windows NT. Although the features differ somewhat among these product versions, each supplies good data backup and restore. Additionally, ARCserve and Seagate Backup Exec offer a variety of options that provide cross-platform support, letting you back up your heterogeneous network from a single application.

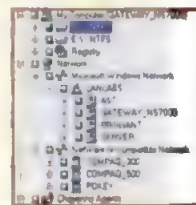
In addition to ARCserve and Backup Exec, we review Stac's Replica. We also requested a review

INSIDE

NETWORK BACKUP goes cross-platform. Don't leave home without it.

Contributing editor Steve Rigney puts NetWare and Windows NT versions of Computer

Associates' ARCserve, Stac's Replica, and Seagate's Backup Exec to the test.



MODEM-SHARING SOFTWARE

You may not have to invest in an ISDN router to give your home or small office Internet connections. Contributor David Levine looks at two packages that let you share an individual modem and ISDN adapter among multiple PCs. *Page 241.*

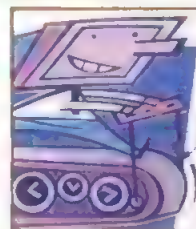
SERVERS AT BARGAIN PRICES

In Multiple Access, senior networking editor Frank J. Derfler, Jr., tells you how to take advantage of today's inexpensive servers to consolidate your applications and data. *Page 242.*

ALWAYS ON ISDN Soon you'll be able to use your ISDN line as a permanent connection to your Internet service

provider or corporate office for only a few dollars more than you're spending today.

In Internet Tools, contributing editor Les Freed tells you how it will work. *Page 247.*



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Net Tools

NETWORK BACKUP

unit of Legato's NetWorker. Although NetWorker has appeared in all of our past network-backup roundups, Legato declined to participate—claiming that its product was designed for more diverse high-end enterprise networks with legacy systems. We looked closely at IBM's Adstar Distributed Storage Manager (ADSM), but found that the Windows NT version wasn't designed to work with our hardware configuration, and that ADSM wasn't available for NetWare, so it was excluded here.

Each product we reviewed is available in two different versions, single-server and enterprise. The single-server editions of ARCserve and Backup Exec allow the backup of multiple client PCs as well as a single server. If you have more than one server and don't want to invest in multiple tape devices and copies of backup software, the enterprise editions will serve you best. With the exception of Replica, the solutions offer optional products that will cost you extra.

AGENTS

Unless you have a very small network, chances are you'll want to protect multiple servers and a handful of clients with a single backup server and tape device. A backup server can do this only by using agents, the software you load on a remote server or

client PC that lets you back up and restore data across the wire. Replica provides agents only for other NetWare and Windows NT

servers, whereas the other two products offer agents for almost every server and desktop OS under the sun. Backup Exec bundles agents for Windows 3.x, Windows 95, Windows NT, DOS, and OS/2. ARCserve for Windows NT offers an even more impressive array, bundling agents for Windows 3.x, Windows 95, Windows NT Workstation, and the NetWare version offers software for Windows 3.x, Windows 95, DOS, and OS/2—with optional packages available for mainframes, Macintoshes, and almost every flavor of Unix.

DISASTER RECOVERY

If the reason you back up is not wanting to lose any data or productivity, then you want your data back right away when your server crashes. Fortunately, all of the products in this roundup offer some form of disaster recovery to keep downtime to a minimum. Replica offers the simplest and fastest approach to disaster recovery. Recovery comes with every version of Replica, unlike ARCserve and Backup Exec. All you have to do is create a handful of disks and full backup to a tape device. If the server dies, you can boot from the disks and recover your backup

within an hour. ARCserve and Backup Exec make you reinstall part of the OS before restoration. Though this works, it's more complicated and takes more time. Still, these products let you create disaster recovery disks for remote servers across the wire; Replica does not.

WHAT WE FOUND

For basic backup and restore, ARCserve and Backup Exec finished in a dead heat. You can perform full and incremental backups with both these products. Replica is not as flexible, but it's faster than the other two, because it replicates an entire volume at the block level. Consequently, Replica can also back up open files. ARCserve and Backup Exec offer restore utilities, yet Replica relies on existing file management utilities such as Windows Explorer to retrieve data from tape more slowly.

If you need strong scheduling, tape rotation, reporting, device management, and dozens of other options along with solid backup and restore, ARCserve is your best bet. Though it doesn't have as many options, reports, and tape rotation algorithms, Backup Exec offers ease of use, lower cost, and better performance. These features earned it the Editors' Choice in this roundup. But if all you care about is protecting the data on your servers and limiting downtime, Replica is the way to go.

SUMMARY OF FEATURES

See www.pcmag.com for interactive views

Network Backup Software

PC MAGAZINE
EDITORS' CHOICE

	ARCserve		Replica 3		Seagate Backup Exec	
	6.1 for NetWare	6.5 for Windows NT	for NetWare	for Windows NT	for NetWare 7.5	for Windows NT 7.0
■ YES □ NO □ OPTIONAL						
List price of enterprise edition	\$1,895	\$1,395	\$1,995	\$1,995	\$1,395	\$1,395
Server Operating Systems Supported						
Microsoft Windows NT Server 3.51/4.0	□ □	■ ■	■ ■	■ ■	■ ■	■ ■
NetWare 3.x/4.x	■ ■	□ □	■ ■	■ ■	■ ■	□ □
Unix	□	□	■	■	■	■
Client Backup Agents Included						
DOS/Microsoft Windows 3.x	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Microsoft Windows 95/Windows NT Workstation	■ □	■ ■	■ ■	■ ■	■ ■	■ ■
Macintosh / OS/2 / Unix	□ □ □	□ □ □	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Server Agents						
Lotus Notes/Microsoft Exchange Server	■ ■	■ ■	■ ■	■ ■	□ □	□ □
Microsoft SQL Server/Oracle7	■ □	■ ■	■ ■	■ ■	■ □	□ □
Unattended backup/restore	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Simultaneous multiple-device backup/restore	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Backs up open files/Creates media pools	■ ■	■ ■	■ ■	■ ■	□ □	■ ■
Spans multiple tapes with the same data	■	■	■	■	■	■
Backs up Novell's NDS/Windows NT Server Registry	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Supports 4-mm/8-mm DAT drives	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Supports DLT/auto-loader devices	■ □	■ □	■ ■	■ ■	■ □	■ ■
Reads SIF/Microsoft Tape Format (MTF)	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Provides GFS/Tower of Hanoi/custom tape rotations	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Disaster recovery/RAID/Virus scanning	□ □ ■	□ □ ■	■ ■ ■	■ ■ ■	□ □ ■	□ □ ■

ARCserve for NetWare, ARCserve for Windows NT

Choosing between Computer Associates' ARCserve and Seagate Backup Exec is a difficult call. The two are fairly evenly matched, although ARCserve earns kudos as the more powerful solution for the purely heterogeneous environment, since it can back up a greater number of platforms than Backup Exec. Though the ARCserve versions for NetWare (Version 6.1) and Windows NT (Version 6.5) probably have the most options of any product in this roundup, you'll spend a lot of time and money installing software to use them all. The basic package includes backup and restore, and Computer Associates offers optional packages for hierarchical storage management (HSM), mainframe backup, disaster recovery, auto-loaders, and managing data on other servers.

The backup package is fairly easy to install and use, although we found it troublesome to navigate through the numerous menus to perform tasks such as scheduling unattended backups. Like Backup Exec with its wizards and strong device support, ARCserve's Windows NT version is stronger than its NetWare counterpart—thanks to a few more bells and whistles. Both ARCserve versions came in last on our benchmark tests, though not by a wide margin.

One of the most complicated things about ARCserve stems not from the technology itself but rather from the pricing structure. The NetWare product is sold in several versions ranging from IntranetWare for Small Business (\$395 list) to an unlimited Enterprise Edition (\$1,895), which we tested. The Windows NT version is available in single-server (\$695) and enterprise (\$1,395) editions.

Other ARCserve options include the RAID Option (\$995), Image Option (\$995), Tape Library Option (\$595), Optical Library Option (\$1,295), Mainframe Backup Option (\$6,995), Disaster Recovery for Windows NT (\$395), Data Migration Storage Server (\$2,995), Data Migration Agent for Windows NT Server (\$495), and Data Migration Agent for Windows NT Workstation (\$95). Image Option is unavailable for the

EDITORS' CHOICE

• Seagate Backup Exec



All of the reviewed products proved adept at backup and restore functions, but Seagate Backup Exec (for NetWare 7.5 and for Windows NT 7.0) just barely

edged ahead of ARCserve in performance, bang for the buck, and ease of use.

Backup Exec comes with a bevy of features such as multiple server and client agents and (in the Windows NT version) wizards and a device manager. Available options include an Intelligent Disaster Recovery utility.

Tasks like starting a backup, performing a restore, and creating a media set are made easy through the Backup Exec Assistant, which appears each time you start the client software.

ARCserve performed nearly as well and

offers even more features. Unfortunately, most of them come as options, which means that the product is more expensive and complex to implement. But this unit is the best network backup solution for a truly heterogeneous environment, because it supports more platforms than any of the other products we reviewed.

Replica, from Stac, doesn't boast a lot of bells and whistles, but it is by far the easiest, most straightforward solution in this roundup. Since it copies data block by block rather than file by file as ARCserve and Backup Exec do, Replica offers faster backup and safe replication of files in use.

NetWare version. A Windows NT server agent for the NetWare version and a NetWare agent for the Windows NT version cost \$495 each. (All of these prices are list.)

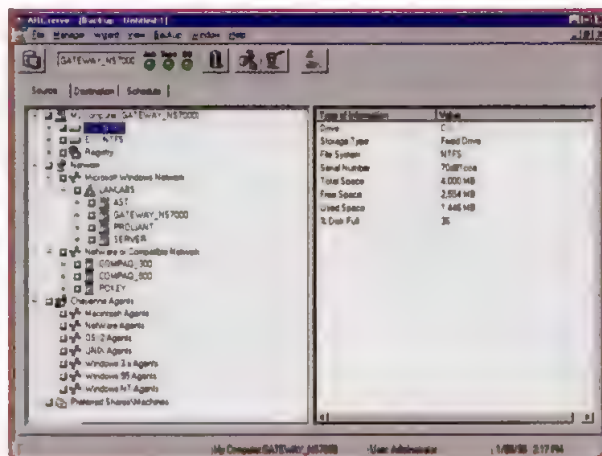
Some of the differences between the NetWare and Windows NT versions concern client agents. The latter version includes

IBM/AIX, Silicon Graphics IRIX, and Sun Solaris.

We liked the HTML page that automatically popped up when we inserted the ARCserve CD. Using a standard Web browser, you can read about the ARCserve products and start the installation routine. ARCserve is a snap to install; it took us just a few minutes. After setup is complete, you can use either the Windows NT wizards or the ARCserve Manager program to perform backup and restore tasks. But when it comes to disaster recovery, Stac's Replica has the simplest approach of any solution we reviewed—requiring only a few disks and a complete replicated tape.

Like Backup Exec, ARCserve offers disaster recovery as an option. And both let you create recovery disks for a remote server. But unlike Backup Exec, ARCserve for Windows NT lets you restore a crashed system's data across the wire without installing a tape device on the remote server. The disaster recovery option in ARCserve for NetWare currently doesn't provide across-the-wire recovery.

We found ARCserve's Scheduler, with its calendar view and built-in tape rotations, to be extremely powerful yet a little confusing. For instance, we had to provide the name of the media set we were going to use to store data, and unfortunately you can't browse for the current media set in the device. Likewise, we found it difficult determining how to cre-



THE ARCserve main menu lets you pick any of your servers or agents to back up.

agent software to back up PCs running Windows 3.x, Windows 95, and Windows NT Workstation. The NetWare version includes agents for Windows 3.x, Windows 95, OS/2, and DOS. Agents for the Macintosh and almost every flavor of Unix are available at an additional cost—\$695 each for SCO UnixWare and \$995 each for HP/UX,

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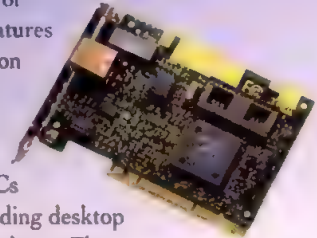
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Net Tools

NETWORK BACKUP

ate a job to run immediately rather than at a scheduled time. We had a much easier time using the wizards in the Windows NT version to create our backup and restore jobs, because we didn't have to fill in as many boxes.

ARCserve generates a tremendous number of reports, which are stored in a powerful database. You can pull them up and edit them at any time. You can also set up very detailed filters on the files you want to back up and restore. On our tests, we created a backup job that stored only data with a hidden attribute. The other two products in this roundup simply don't offer the same level of filtering.

ARCserve 6.1 for NetWare. List price: single-server edition, \$695; enterprise edition, \$1,895. **ARCserve 6.5 for Windows NT.** List price: single-server edition, \$695; enterprise edition, \$1,395. Computer Associates International, Islandia, NY; 800-243-9462, 516-342-5224; fax, 516-630-2028; www.cai.com/cheyenne. Choose 902 at www.pcmag.com/infolink.

Stac Inc.

Replica for NetWare, Replica for Windows NT

Stac's Replica 3 for NetWare or for Windows NT takes a different approach to backup than the other two storage management products in this roundup. Designed to keep an exact replicated copy of your entire NetWare or Windows NT server's volumes, Replica offers one of the easiest and fastest backup products on the market, although we found it takes a long time to perform a restore. If you want to back up individual or changed files, keep detailed reports, and perform sophisticated tape rotations, Replica is not a good solution. If you need powerful disaster recovery in an easy-to-use package, however, it is one of the best and most straightforward products on the market.

What we liked best about Replica is the unique way it stores data on tape. Most network backup or storage management programs, including the other products in this roundup, copy data on a file-by-file basis from the server to a tape device. Although this is the most flexible way to copy data, it is a little slower than Replica's approach. Replica operates at the logical-volume level. This means that it replicates the entire volume to tape and copies each block sequentially. Because Replica's Object Replication Technology doesn't open the data during a backup like products that copy file by file, we could safely replicate files that were in use, something we couldn't do with the other products reviewed here. And replicating the entire volume block by block also proved

much faster than copying on a file-by-file basis. The Windows NT version of Replica took 29:26 to back up on our test, while the NetWare version

took 25:12. The nearest competitor, Backup Exec, reported backup times of 32:13 and 29:18 for the Windows NT and NetWare versions, respectively. Unfortunately, this method didn't let us back up individual files or perform incremental backups of changed data.

Unlike ARCserve and Backup Exec, Replica offers all of the same major features

Compared with ARCserve and Backup Exec, Replica is by far the fastest and easiest disaster recovery solution. To use this feature under both NetWare and Windows NT, you need only create a handful of floppy disks and have access to a full replicated tape. If the server dies, you simply boot from the disaster disks and insert the tape in the drive. The other products reviewed here required us to install a minimal part of the OS before we could recover data. You can also perform disaster restoration across the wire with the NetWare product.

Although Replica let us schedule backups and keep a history log of all of the jobs we ran, it didn't provide a lot of the bells and whistles found in ARCserve and Backup Exec. For example, you can't perform automatic tape rotations or view reports on your devices and tapes. Many administrators don't need these added features, however, and are really only concerned with having a reliable product with which to secure data.

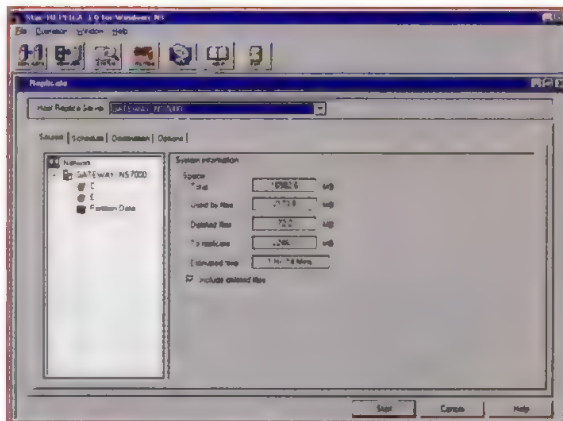
Replica 3 for NetWare. List price: single-server edition, \$624; Intranetwork version, \$1,995. **Replica 3 for Windows NT.** List price: single-server edition, \$624; In-

tranetwork version, \$1,995. Stac Inc., San Diego; 800-279-7822, 619-794-3741; fax, 619-794-4570; www.stac.com. Choose 904 at www.pcmag.com/infolink.

Seagate Software

Seagate Backup Exec for NetWare, Backup Exec for Windows NT

The history of Seagate Backup Exec has made for a very powerful storage management solution. After all, since the name Backup Exec has been in existence for several years and has been owned by at least three different companies, pieces of it are found in your favorite operating systems, including Microsoft Windows 95 and Windows NT. Although Seagate offers several versions of Backup Exec aimed primarily at the low-end, standalone market, Backup Exec for NetWare and Backup Exec for Windows NT are the two flagship products. They share most of the same basic features, including strong backup and restore functions, excellent disaster recovery options, multiple server and client agents, and easy-to-use menus. Wizards, a device manager, and support for more hardware



THE REPLICA main menu lets you easily select the volumes and servers you want to back up.

in both the NetWare and Windows NT versions. Both versions are available in single-server and Intranetwork versions. The \$624 single-server edition only lets you back up the server that the product is loaded on and doesn't work with auto-loader tape devices. The \$1,995 Intranetwork version lets you back up multiple servers to a single backup device. Note that both versions work with DLT (digital linear tape) devices, but only the Intranetwork version for NetWare works with auto-loader devices. Replica doesn't include any client agents to let you back up or restore a client PC's data, something that the other products in this roundup do provide. You can also download a free 60-day evaluation copy of Replica from Stac's Web site.

Replica also differs from ARCserve and Backup Exec in that it doesn't include a utility for restoring files from tape. To retrieve a file, you simply use the Replica utility to mount the tape as a volume. Once the tape is mounted you can use any application or file utility, such as Windows Explorer, to retrieve the data from the tape. Consequently, any user can retrieve data with little or no help from the administrator. Still, we found this method of restoration much slower than the utilities provided by ARCserve and Backup Exec—10:25 compared with 3:12 and 2:48, respectively.



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Net Tools

NETWORK BACKUP

make the Windows NT version the easier and more powerful of the two, however. The Windows NT version is also the only product in this roundup built around Microsoft's new COM (Component Object Model) architecture, a standard that lets developers write snap-in programs that can communicate with other COM-based applications, particularly after Version 5.0 of Windows NT becomes available.

At 29:18 for the NetWare version and 32:13 for the Windows NT product, Backup Exec came out behind Replica (25:12 and 29:26) but ahead of ARCserve (33:16 and 35:36) on our backup tests. With a time of 2:48 for NetWare and 3:02 for Windows NT, Backup Exec edged ahead of ARCserve (3:12 and 3:46) and significantly outpaced Replica (10:25 and 10:12) on our restore test.

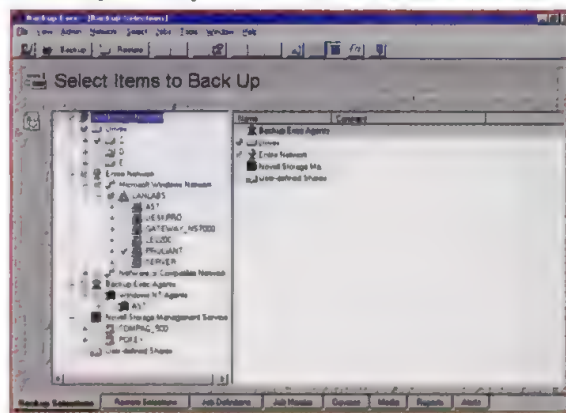
Each version of Backup Exec comes in two different flavors, a \$695 Single-Server Edition and a \$1,395 Enterprise Edition. The major difference between the two editions is that the Single-Server Edition can only protect one server, whereas the enterprise version can support an unlimited number of servers. The Single-Server Edition, like the Enterprise

Edition, has no limits on the number of clients it can back up. Other features not bundled with either version but available as options include Intelligent Disaster Recovery (IDR) software and an auto-load driver, which list for \$495 and \$595, respectively.

In this roundup, Backup Exec comes in second to Replica for ease of installation and configuration. Both versions of Backup Exec let you install the product on a server, but only the NetWare version supports installation from a remote client PC. The Windows NT version must be installed at a server or using Microsoft's SMS. Once the files are copied, you simply restart the server and you are ready to back up. In the Windows NT version, we liked the device wizard that walked us through setting up our hardware during the installation. The Windows NT version also provides a utility called the Backup Exec Assistant, which pops up every time you start the client software. The Assistant is a group of

wizards that guide you through performing tasks, such as starting a backup, creating a media set, performing a restore, and setting up new hardware. Neither of the other two products in this roundup provides as many wizards.

Though it is an option only, IDR is one of our favorite features. You can use this utility to create a set of recovery disks for your backup server and all of the Windows NT and NetWare servers on your network. If a server dies, you boot from the IDR disks and Back-



THE BACKUP EXEC main menu lets you see all of the servers and client agents from a single selection window.

REAL-TIME DATA PROTECTION

The Replication Alternative

By Steve Rigney

When network administrators think of data protection, they usually picture the backup/storage management products featured in the main roundup. These products are designed to store your important data on tape or some other removable media. Though this is a safe and efficient way to protect data, it isn't always fast, and it leaves data unprotected between scheduled backups. A new trend in data protection is using one or more servers to store critical data. You can copy data to a server much faster than to tape, and hard disk prices drop almost every day. Once data is stored on a server, you can easily use one of the products in the roundup to copy it to a removable tape or other storage device.

Real-Time Replicator for Windows NT (RTR), from Network Integrity (800-638-5578, www.neint.com), has become one of the most popular data-protection replication products on the market. And as we discovered, a new high-end product from

Stac Electronics (800-279-7822, www.stac.com), code-named Sequoia, also holds promise.

Neither a tape-based backup program nor a clustering product, RTR fits into a new category of solutions known as replicators. It lets you schedule or make real-time copies of your data to a single Windows NT server or group of servers. The package includes two pieces of software, for the target server and the source server, which each retail for \$1.195 (list) per single license. Since any Windows NT server can function as either a target or source server, you can spread the same data among multiple servers to ensure that it's protected.

Though backup utilities normally run only once or twice a day, you can configure RTR to run in real time or at certain thresholds. You can even tell the software what percentage of network bandwidth to use while copying a file. To reduce the network traffic it generates, RTR sends only changes within the files you've ac-

cessed since the last copy was made. This flexibility lets you protect your valuable data as often as you feel is necessary.

Stac's **Sequoia** is basically a very high-end version of RTR designed to work with hundreds of clients and servers located on a WAN. Initially, Sequoia will retail for around \$100,000 per site and will be offered only to large companies early next quarter. What makes Sequoia unique is its seed technology. When you first install Sequoia, you select the server or client on the WAN that will function as the seed PC. A good seed is a client/server system that has all of the applications and data that you use on your network. Sequoia copies the entire contents of the seed to a single replication server. Once the seed is stored, all other PCs on the network can replicate quickly to the server, because the software sends only updated data across the wire. In theory at least, you could back up a server with over 1 GB of data in a matter of minutes.

In the future, we think you'll see these types of replication programs used in conjunction with backup products to ensure the safety and availability of your data. If money is tight and you can't afford to buy both backup and replication products, we recommend a basic tape backup solution.

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Net Tools

NETWORK BACKUP

up Exec will launch the Windows NT or NetWare setup utility and install a minimal copy of the OS, so you can restore your data.

Still, we don't like the fact that you must install the tape device on the server you are trying to recover. If the product can back up servers across the network, it should be able to restore from a disaster the same way ARCserve does. The Windows NT version of Backup Exec also requires you to update the IDR disks every time you perform a full backup on

servers after a backup.

Backup Exec doesn't generate as many reports as ARCserve, but it does provide all the information you should need. You will find reports on your backup and restore jobs, your tape hardware, and your media. And you can view these reports online or, if you're using the Windows NT version, you can use Sea-

gate's Crystal Reports to edit them. Both versions include capable notification features that can send an e-mail or a page to an administrator if there is a problem with the server, tape, or media.

Seagate Backup Exec for NetWare 7.5. List price: Single-Server Edition, \$695; Enterprise Edition, \$1,395. **Seagate Backup Exec for Windows NT 7.0.** List price: Single-Server Edition, \$695; Enterprise Edition, \$1,395. Seagate Software, Heathrow, FL; 800-327-2232, 407-531-7500; fax, 407-531-7730; www.seagatesoftware.com. Choose 903 at www.pcmag.com/infolink. **PC**

BENCHMARK TESTS

Network Backup Software



All the products did well on our backup and restore tests. Replica finished first on our backup test, but it took more than twice as long to complete

our restore test as its nearest competitor. Backup Exec narrowly beat ARCserve on both tests.

What the Numbers Mean

Backup times are usually more important than restore times to network administrators. Backups are performed at night or during slow traffic periods, requiring the job to be finished before people return to the office. The time it takes to restore data after a disaster is less important than the certainty that the data is available on the media.

Replica's exemplary performance on the backup test is explained by the way it writes data to the tape device. Though ARCserve and Seagate Backup Exec use a file-by-file copy method, Replica uses a faster block-by-block volume replication. ARCserve was a little slower than Backup Exec during backup, because at the start of the process it estimates the number of files and the time it will take to complete the job. Backup Exec doesn't perform this estimation routine, which adds an extra minute or two to the process.

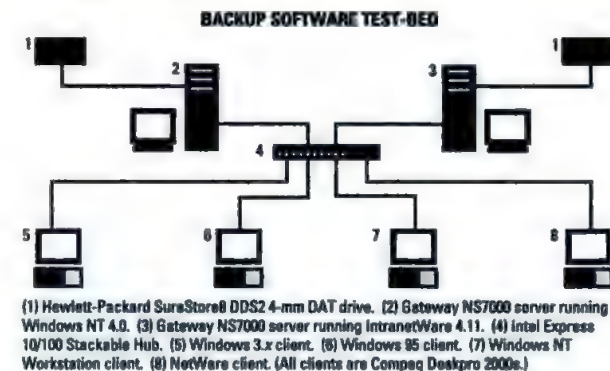
Although Replica excelled on the backup test, it performed poorly during the restore. Replica offers a unique ability to mount the tape as a network volume and use any file utility to copy information off the removable media. This means that the product doesn't require a special restore utility. But using a program like Windows Explorer to copy data from a tape drive takes a lot longer. A proprietary restore utility like those found in ARCserve and Backup Exec reads ahead on the tape or backup inventory to copy the data in blocks instead of file by file. —*Analysis written by Steve Rigney*

How We Tested

To test the products in this roundup, we installed Windows NT and IntranetWare on separate Gateway 2000 NS7000 servers, each with a 266-MHz Pentium II processor and 128MB of RAM. Each unit contained two 4GB Seagate Barracuda SCSI hard disks, formatted as separate volumes on each OS. We installed

the OS system files on the first volume and placed our backup data on the second. Each server also had an HP SureStore 8 DDS2 4-mm DAT drive attached via an Adaptec 2940 SCSI controller. Our test data consisted of a mix of application, text, spreadsheet, graphics, and database files. We combined the files to create approximately 796MB of data. Because most administrators restore only a handful of lost or corrupted files, our restore job consisted of only about 72MB of data.

We performed three backup jobs on both the NetWare and Windows NT servers and restarted and erased the tape after each job. We configured the products to use hardware compression and not to verify the data after it was copied to the tape. As we did for backup, we also ran three restore jobs and restarted the server after each. Once all of the jobs were complete, we took an average of the times to determine our final numbers.



Bold type denotes first place within each category.

	Backup Minutes:seconds	Restore Minutes:seconds
NETWARE		
ARCserve	33:18	3:12
Replica	25:12	10:25
Seagate Backup Exec	29:18	2:48
MICROSOFT WINDOWS NT		
ARCserve	35:36	3:46
Replica	29:26	10:12
Seagate Backup Exec	32:13	3:02
	◀ BETTER	◀ BETTER



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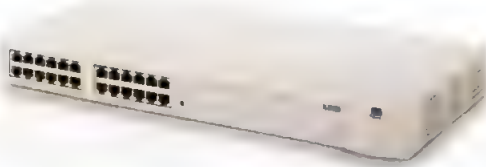
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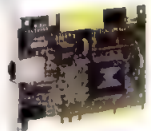
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Net Tools

FROM THE BENCH

MODEM-SHARING SOFTWARE

Your Own IP Party Line

By Daniel B. Levine

Although many workgroup-scale routers, such as the 3Com OfficeConnect ISDN LAN Modem, now fall below the \$500 mark, using these powerful products to provide Internet connections for small 4- to 12-node networks may constitute overkill. Instead, network administrators can turn to such inexpensive software solutions as Virtual Motion's Internet LanBridge and Artisoft's i.Share 2.5, which let users share single or multiple dial-up analog or ISDN connections to the Internet.

Starting at \$99 (list), i.Share provides basic Internet connectivity, security, and administration. Internet LanBridge, which starts at \$149 (list), furnishes equivalent connectivity but also offers stronger administrative and security features for the network.

Virtual Motion Internet LanBridge

Connecting your small IP-based LAN to the Internet via a single dial-up connection is no longer a problem. Virtual Motion's Internet LanBridge (starting at \$149 for three users) lets multiple users connect to the Internet with a single analog or ISDN connection. Though pricier than i.Share, LanBridge provides strong administration and security features, support for popular network protocols, and clients for Windows 3.x, 95, and NT 3.51/4.0. We saw only one

small problem: Many IP applications timed out before an initial Internet connection was made.

The LanBridge manual provides good step-by-step instructions for setting up Windows 95's Dial-Up Networking as well as for its own server software. Client software comes on a single disk. And LanBridge automatically chooses which networking protocol to use. The installation software includes a small utility that enables you to switch between LanBridge's proprietary Winsock and the PC's native Winsock. A system tray icon lets you know which mode the computer is in.

LanBridge is attractive in part because its special server and client software uses

does not have to be a dedicated server, you should make sure that it is fast enough to handle the requirements of Dial-Up Networking and other applications that may be running at the same time.

The wide range of security functions available in the Internet LanBridge Administrator impressed us. A simple wizard allowed us to select the TCP/IP applications—such as FTP, Gopher, and telnet—that each user could access. Also, we could set time-of-day restrictions and block or allow access to specific sites. And unlike in i.Share, the server portion of LanBridge can integrate third-party URL lists for more sophisticated content filtering. More important, we were able to tell LanBridge how long to keep the Dial-Up Networking connection open after a user had closed all TCP/IP-aware applications, which gave us time to close one application and start another without the server disconnecting

phone and establish a connection before reporting an error. To get around this problem, we routinely had to click twice on the same Internet shortcut: first to tickle the LanBridge server into dialing the phone and again to connect to the mail or Web server.

Internet LanBridge. List price: 3-user license, \$149. Virtual Motion, San Francisco; 415-778-0100; www.virtualmotion.com. Choose 901 at www.pcmag.com/infolink.

Artisoft Inc.

i.Share

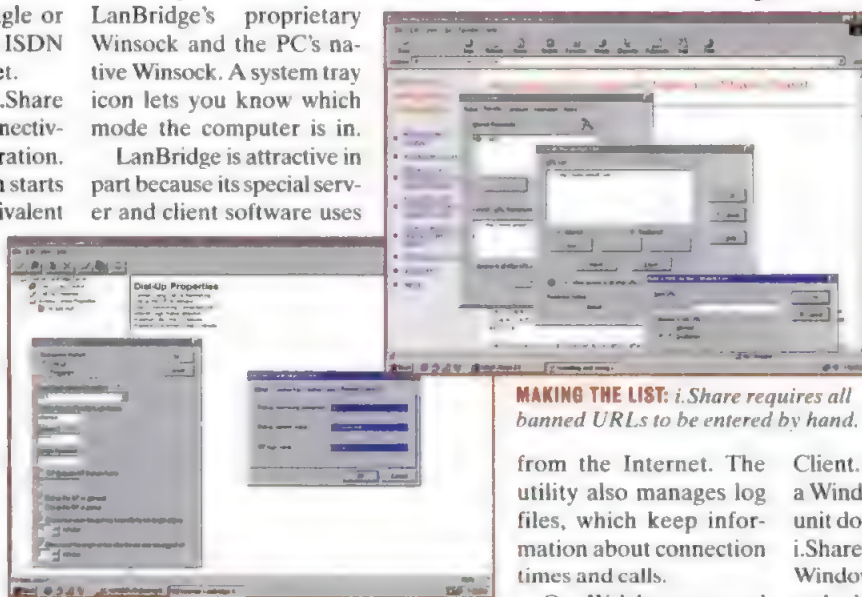
Artisoft, a long-time player in the modem-sharing arena, dispenses with the complexity and expense associated with linking users to the Internet. i.Share 2.5 (\$99 list for a three-user license) gives you an inexpensive and painless way to connect a small workgroup to the Internet via an analog or ISDN connection. We found i.Share easy to install and liked

the ample supply of bundled freeware and shareware. But we would prefer that future releases provide support for IP networks, include a Windows NT 4.0 client, and supply stronger security and content-control features.

Similar to Virtual Motion's Internet LanBridge, i.Share consists of two parts: i.Share Server and i.Share

Client. The server portion sits on a Windows 95 system, though the unit doesn't have to be dedicated. i.Share Client replaces Microsoft Windows' Winsock—the piece of code that lets applications "talk" to a TCP/IP network—with its own proprietary system for routing packets to i.Share Server. Currently, Artisoft offers clients for Windows 3.x, 95, and NT 3.51 but not for Windows NT 4.0. The company is working to rectify this situation and sent us a beta version of the Windows NT 4.0 client.

Installing i.Share took a matter of minutes, using the distribution



MAKING THE LIST: i.Share requires all banned URLs to be entered by hand.

A MATTER OF TIMING: The time LanBridge takes to connect to the Internet may cause applications to time out.

existing IPX, NetBEUI, or IP infrastructure; most users will never have to touch the Networking Properties icon during installation. The server software resides on two floppy disks and must be installed on a Windows 95 or NT machine. Although the system

from the Internet. The utility also manages log files, which keep information about connection times and calls.

Our Web browsers and e-mail clients consistently timed out if the LanBridge server was not already dialed into the PPP account. When we requested a Web page with Netscape Navigator, for example, we received a message that there was something wrong with our network connection. Navigator's internal timer simply was not giving LanBridge the time to dial the

CROSS TALK



Leon Erlanger

Connection-sharing products such as i.Share and Internet LanBridge fill a need, Frank. They let a few people on a LAN share a single Internet connection. That's quite a benefit in small offices, because these hassle-free packages reduce connection costs and eliminate the need for IP on the LAN.

It's also nice that there is a continuum of alternatives, Leon. These products fit in right under the personal ISDN routers offered by a dozen companies. Routers, though more expensive, don't require client software, and they offer extras such as data compression and network address translation.



Frank Derfler

CD's install wizards. The only difficulty we faced occurred after we selected a network protocol from a short list—IPX (for Microsoft and Novell), LANtastic, and NetBEUI—provided by the wizard. The software checks to see whether the selected protocol is actually installed on your LAN

and then prompts you to cancel the installation and set up the proper networking options. Unfortunately, once we chose our protocol, the only way to change it was to uninstall the application and reinstall i.Share from scratch.

We used the server command panel, accessible either from the

Net Tools FROM THE BENCH

Start menu or directly from the system tray, to check the status of connections, set passwords for access, and keep log files. Unlike Internet LanBridge, i.Share limits content control to a list of acceptable and unacceptable URLs that must be entered manually. You cannot import a third-party list, such as the list included with SurfWatch.

In case you want to use your original Winsock to connect to an IP network, Artisoft supplies a batch file that swaps the appropriate files in the Windows system directory. We thought that Artisoft could have provided a better solution than a command line utility, but a batch file is better than nothing at all, and we're glad the company added this op-

tion for users who require it.

Each time a user launches an Internet-enabled application, i.Share Client connects to an i.Share server, automatically attaching itself to the least busy server in a setting with multiple iShare servers. The client prompts the server to dial up the ISP when necessary (each server supports a single dial-up connection).

All of i.Share's documentation is located on the product's CD in either HTML or Adobe Acrobat format. Also included on the CD is a variety of freeware and try-out software, including Qualcomm's Eudora, NetCentric's FaxStorm, Forte's news reader Free Agent, and Artisoft's own excellent XtraMail, a POP3/SMTP mail server.

i.Share 2.5. List price: 3-user license, \$99. Artisoft Inc., Tuscon, AZ; 520-670-7100; fax, 520-670-7101; www.artisoft.com. Choose 900 at www.pcmag.com/infolink.com. **PC**

MULTIPLE ACCESS

Those Wonderful Collapsing Boxes

Have you looked at the values in server hardware today? The server vendors have become really aggressive. Just visit the Web site of Compaq, Dell, Gateway, or any other major vendor and hit the button labeled *Promotions*. Wow.

Microsoft has teamed with several hardware vendors to package the Microsoft BackOffice Small Business Server (SBS) software with appropriate hardware. During January, you were able to lease a Compaq ProSignia 200 Server with SBS loaded on its 4GB Ultra SCSI hard disk for \$162 per month. Considering the current state of interest rates and the bond market, I'll bet good lease deals are still available. It makes you wonder where the Gartner Group does those self-serving total-cost-of-ownership surveys. Leasing a good server is real TCO control.

Undoubtedly, it's a great time to collapse your server. If you have any kind of an intranet, even with only 100 to 200 active users, you've probably got half a dozen or



Frank Derfler

more PC-based servers producing heat in an underventilated closet. It's time to consolidate.

For serious line-of-business applications, I covet a Dell PowerEdge 6100. It can hold up to four Pentium Pro processors and is ready for the I2O I/O technology, which will make a significant

difference in throughput (for more information, see Internet Tools, "Beating the Bottleneck," January 20, 1998).

I would confidently collapse my DNS, intranet proxy, URL filter, and Web servers, and any others, into a Compaq ProLiant 1600, a Dell PowerEdge 4200, or a Gateway 9000, with dual processors, drives, and power supplies. My only hesitation is caused by the significant price boost that comes from adding a RAID subsystem. Including RAID 5 in the mix can double the price of the system. Today, I'd settle for hot pluggable hard disks and forget about RAID 5. I'd rather pay for server clustering using the new Microsoft Cluster service—even with 1-minute service-recovery

times—than pay for RAID.

Thoughts of consolidating servers automatically raise concerns over the dangers of creating a single point of failure. An interruption of a multipurpose server can cause great inconvenience as well as limit your career. But as one savvy LAN administrator said to me, "A network with a lot of old servers just has multiple points of failure." I agree. I'd rather rest my reputation on ECC memory and redundant internal devices inside a single modern server.

Looking at the server horizon, I see 64-bit processors getting closer. The collaboration of Hewlett-Packard and Intel is expected to produce the 64-bit Merced chip in 1999. If you can believe the early PR, this chip is aimed right at the server market. Most Unix vendors, except Sun at this time, promise 64-bit operating systems and applications for this chip. The map is still blank, but with legitimate competition from Sun's UltraSPARC system, Intel will need to make a pretty big push into the 64-bit server market. Those servers will aim first at juicy line-of-business applications. Beyond 2000, you'll see more power and the ability to do more server consolidation. This means that the time is right to consolidate into multi-CPU Pentium servers acquired on a nice three-year lease.

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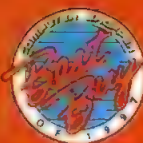
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Each model features 32MB RAM



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200MHz Pentium Pro*	32MB	—	8X	10/100	\$3068.00	89061
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*Rack model **Hot plug rack model



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200MHz Pentium Pro	32MB	Upgradeable	\$4318.00	77387
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*Includes SMART-2/P Array controller **Rack model

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IBM PC Server 315

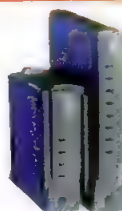
- Intel Pentium[®] Pro processors
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- Six expansion bays: three or four available (depending on configuration)
- Includes: PCI Wide Ultra SCSI hard drive controller
- 3-year warranty



IBM PC Server 315

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200MHz Pentium Pro	4.3GB	8X	10/100Mbps	\$2535.75	97659

Each model features 32MB RAM



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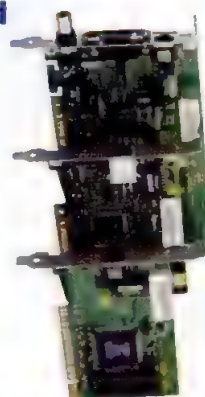
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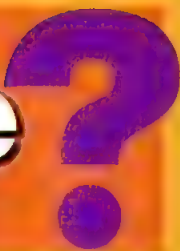


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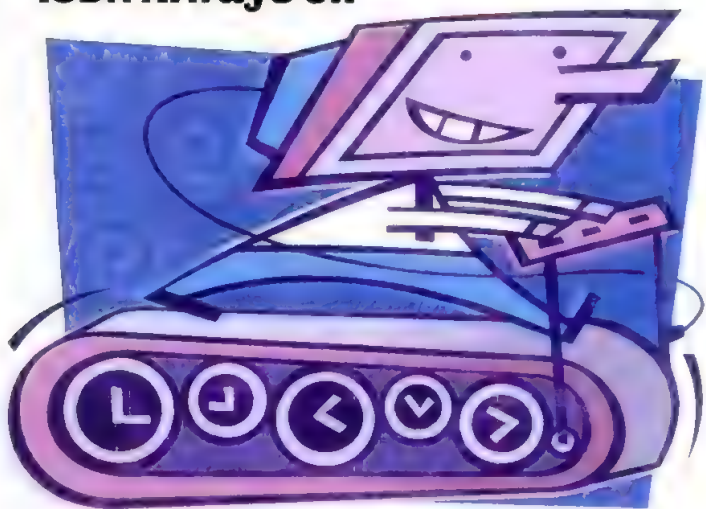
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Net Tools

INTERNET TOOLS

ALWAYS ON/DYNAMIC ISDN

ISDN Always On



By Les Freed

A little drip, running all the time, moves a lot of water. That's the concept behind a new type of Internet/intranet connection service and, of course, a new acronym: *AO/DI* (Always On/Dynamic ISDN) is a new type of ISDN service that provides a full-time, low-speed (9.6-Kbps) connection to your ISP or corporate LAN. As your traffic needs increase, AO/DI automatically bumps the bandwidth up to 64 or 128 Kbps using the Bandwidth Allocation Control Protocol (BACP). Like normal ISDN lines, an AO/DI line can support simultaneous voice and data connections. The always-on aspect makes AO/DI great for use with push services and puts ISDN closer to par with always-on cable modem and DSL services.

All ISDN lines provide three discrete communications circuits. The two bearer channels (B-channels) each provide 64 Kbps

of dial-up bandwidth. Like ordinary phone lines, B-channels provide a switched connection between one ISDN line and another phone line. The third channel, or D-channel, is a 16-Kbps channel that is normally used to pass signaling information—ring signals, caller ID data, dialing instructions, and so forth—between your ISDN equipment

and the phone company's central office. The signaling information does not come close to using the entire 16-Kbps bandwidth of the D-channel. AO/DI uses extra D-channel bandwidth to establish a full-time 9.6-Kbps X.25 packet-switched connection between your PC and the ISP or your corporate remote-access router. Most regional phone companies already have extensive X.25 packet-switched networks. The cable companies and other competitive DSL carriers face significant costs for installing new high-speed backbones.

Created by the Vendors' ISDN Association (VIA), AO/DI is, as you might expect, largely based on existing standards and protocols. In many cases, you'll be able to upgrade your existing ISDN equipment to AO/DI via a flash ROM upgrade. AO/DI is backed by many of the major players in the ISDN industry, including Ascend, Bay Networks, Cisco Systems, Eicon Technologies, Intel, Jetstream Communications, Microsoft, and 3Com. Several phone companies have already committed to supporting AO/DI, including BellSouth, Pacific Bell, and Southwestern Bell. You can get more information about available service and equipment options at www.via-isdn.org and by checking with your local telephone service provider or any competitive local-exchange carrier (CLEC) operating in your area.

HOW IT WORKS

When you power up an AO/DI terminal adapter or router, the firmware in the TA or router automatically establishes a low-speed TCP/IP connection to your ISP. The low-speed connection is more than adequate for such tasks as downloading e-mail and browsing text-based Web pages. When traffic exceeds the capacity of the D-channel connection, the equipment automatically places a B-channel call to the ISP and switches the data traffic to the faster channel. When necessary, a second B-channel can be added using Multilink PPP, just as with regular ISDN.

AO/DI doesn't use the X.25 D-channel connection once the B-channels take over: Doing so would actually slow down the link, since X.25 has an inherently long latency time. When traffic on the B-channels drops below the 9.6-Kbps threshold, the links are dropped and the data traffic switches back to the D-channel circuit. Thanks to ISDN's fast call-setup times, adding and dropping channels are completely transparent to the user. From the user's perspective, the line appears to be connected at 128 Kbps at all times.

SOMETHING FOR EVERYONE

AO/DI isn't available nationwide yet, but we expect that it will be soon. AO/DI is a win/win/win proposition for phone companies, ISPs, and users. It

AO/DI

What differentiates Always On/Dynamic ISDN from standard ISDN is AO/DI's use of the D-channel for carrying more than setup and signaling data. The D-channel keeps a 9.6-Kbps connection open for regular data transmission until the ISDN terminal adapter deems that it needs one or both 64-Kbps channels.

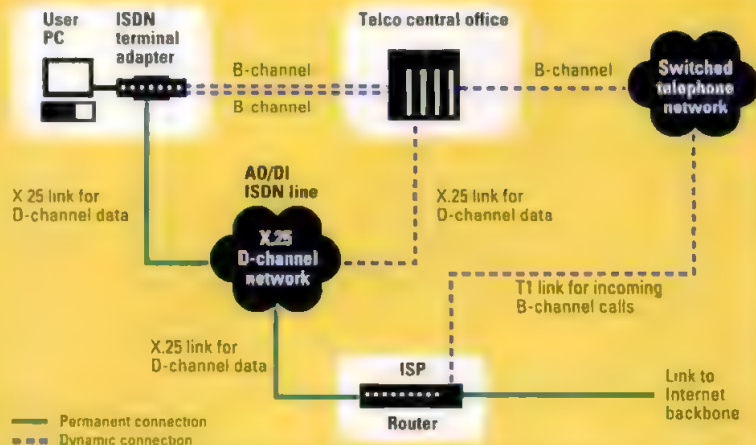


ILLUSTRATION BY MARK SHAWER

provides a way for phone companies to increase revenues while reducing the load on their central office equipment. For a few dollars more than a standard ISDN line, ISDN users get a guaranteed full-time Internet or remote-LAN connection. ISPs like AO/DI because it allows them to service more users without adding more equipment or lines. You do have to arrange for AO/DI service with your ISP just as you do for connections to the so-called 56K modems. Unlike with 56K modem upgrades, with AO/DI an ISP doesn't have to buy a lot of equipment for multiple lines, but at least one ISP device must monitor the X.25 D-channel service for packets.

By providing a full-time connection using the existing X.25 network, phone companies can allow users to maintain a full-time Internet connection without placing any burden on the backbone telephone network. AO/DI also allows ISPs to serve more users more efficiently by combining the data channels for several users into a single X.25 connection. And users will benefit from AO/DI in several ways. First, the full-time nature of AO/DI forever eliminates the need to dial into your ISP. Incoming e-mail arrives immediately, and push clients such as BackWeb and PointCast update continually as you work. Real-time messaging products such as HotOffice and ICQ become much more viable when you're continuously connected, since your correspondents can always locate you. Remote access to your home or office machine is possible from anyplace on the Internet, because your machine is constantly connected to the Internet. You can leave a Web or FTP server running all the time and access it from anyplace, anytime—something you can't do if your PC

is connected via a dial-up ISP connection.

As demand for Internet access increases, phone companies and ISPs are often at odds with users. Many users leave their ISP connections up all day long, tying up trunk lines at central offices and tying up lines and router ports at the ISPs. Flat-rate pricing for both ISDN and Internet access has

contributed to the problem, since it doesn't penalize users for hogging resources. In order to prevent busy signals (and the resulting customer annoyance), phone companies and ISPs made major upgrades to their switching and routing equipment. Some phone companies have asked for rate increases to help offset the additional costs, raising phone rates for everyone. Similarly, ISPs have

added phone lines and router ports to accommodate the increasing demand for connections. At the same time, the average price for Internet access has fallen, placing some ISPs in precarious financial positions. AO/DI's constant D-channel connection will help solve the telcos' and ISP's access problem by eliminating the need for users keeping their B-channels up continuously.

OBSTACLES AND ROADBLOCKS

Although AO/DI has attracted considerable support from phone companies and equipment vendors, it's still a long way from nationwide availability. Deployment is likely to be spotty at first, as each regional phone company and ISP decides whether to offer the service. AO/DI requires software updates for phone company switches and ISP access routers, and not all router makers have committed to AO/DI.

When AO/DI does become available, it will have the unfortunate side effect of adding another

Net Tools

INTERNET TOOLS

layer of complexity to the process of ordering ISDN. VIA has proposed a new version of the EZ-ISDN ordering codes that will support AO/DI, but many phone companies still don't use the existing EZ-ISDN ordering codes, instead requiring customers to deal with ISDN's labyrinth of provisioning options.

Then there's the issue of tariffs. Most phone companies already offer X.25 over the D-channel, but you pay dearly for the service. X.25 D-channel connections are frequently used for credit card verification terminals, automatic teller machine (ATM) connections, stockbroker terminals, and other full-time, high-reliability connections. Until now, users have been willing to pay a premium price for X.25 service. Pacific Bell has set an example we hope other telcos will follow by offering AO/DI for \$5 per month more than normal ISDN. Regardless of the amount, each phone company will have to take its proposed AO/DI tariff before its local Public Service Commission, a process that can take months.

We expect to see a flood of AO/DI products this spring. Jetstream Communications is already shipping an AO/DI-enabled version of its ISDN phone system Front Desk, and

Eicon Technologies recently began shipping AO/DI-enabled versions of its Diva T/A cards, and the company has announced that all existing Diva T/A products will be upgradable to AO/DI.

One potential hurdle—compatibility—has already been addressed. The VIA, composed of companies that struggled through the compatibility nightmares of the early days of ISDN, is conducting a series of "bake-offs." Member companies can bring their AO/DI products to the bake-offs and test them against other members' products to insure compatibility. We're already seeing the first wave of AO/DI products. Eicon Technologies, one of key companies behind AO/DI, is now shipping an AO/DI-capable ISDN terminal adapter. Pacific Bell recently installed several AO/DI lines at PC Magazine Labs in Foster City, California, so we'll be able to test new AO/DI products as they hit the market.

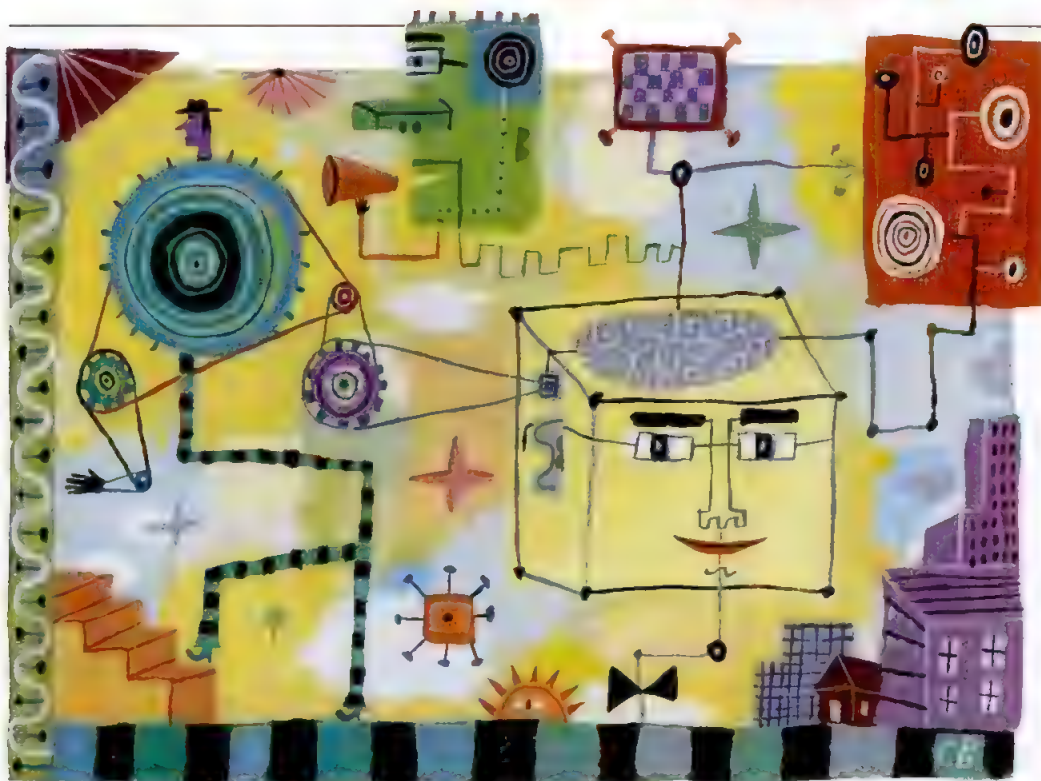
AO/DI gives ISDN a little more staying power in the battle against DSL and cable modem technologies. Although most of the early AO/DI activity has focused on providing IP Internet connectivity, AO/DI could also be used for such other LAN protocols as IPX and NetBEUI. Its full-time connection makes AO/DI an ideal way to connect remote LAN users and small branch offices into a corporate LAN. **20**

Internet Connections

■ YES ■ NO	Analog modem	ISDN	AO/DI ISDN	xDSL	Cable modem
Maximum throughput	53 Kbps	128 Kbps	128 Kbps	8 Mbps or faster	10 Mbps or faster
Voice and data	■	■	■	■ *	■
Full-time IP link	■	■	■	■	■
Availability	Nationwide	Limited	Limited	Limited	Limited
Standards-based	■	■	■	■	■
Reliability	Excellent	Good	Good	Too early to tell	Good
Whom to call for connection	Local phone company	Local phone company	Local phone company	Local phone company, local power company, or other CLEC	Local cable company

* Some variants of xDSL run over POTS lines, allowing the lines to be used for phone calls

PC Tech



Windows NT Option Pack

With a wealth of new features, the Option Pack moves Windows NT toward becoming a complete enterprise operating system.

By Keith Pleas

Microsoft is trying something new with the Windows NT 4.0 Option Pack, which is available for free downloading from the company's Web site (www.microsoft.com/iis) and is included with new shipments of Windows NT 4.0. Falling somewhere between a familiar Service Pack and a full version upgrade, the Option Pack includes updates to selected Windows NT services as well as some new components, including:

- Microsoft Management Console;
- Microsoft Internet Information Server 4.0;
- Microsoft Transaction Server 2.0;
- Microsoft Message Queue Server 1.0;
- Certificate Server 1.0;
- Internet Explorer 4.01;
- Internet Connection Services for Microsoft RAS;
- Index Server 2.0;
- Site Server Express;

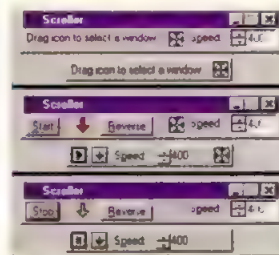
- Windows Scripting Host;
- Data Access Components.

According to Microsoft, everything in the Option Pack is now officially part of the operating system. This is significant, because Windows NT now contains components that handle transaction processing, message queuing, data access, and even Web site management. The Option Pack also demonstrates a new setup process for Microsoft system software: All components are integrated, and a local setup utility installs individual components using Microsoft's Internet Component Download process.

Some Option Pack components support each other. Index Server has been upgraded, which is fortunate, since all Option Pack documentation is HTML-based, and Index Server 2.0's new search capabilities are a necessity when you're trying to find something in a mountain of HTML (the Option Pack documentation consists of more than 6,000 separate files). Under

INSIDE

INTERNET TECH: Java Media Framework is a new multimedia architecture from Sun that provides portability and extensibility to a degree not found in the previous Java multimedia API. *Page 256.*



▲ UTILITIES: If you find it tedious to page down through long Windows documents or Web pages, we have the answer for you. Scroller, this issue's free utility, lets you select a window and automatically scrolls it down at the speed you choose. *Page 259.*



▲ PC SOLUTIONS: Getting Dial-Up Networking to remember your password; will a faster CPU or more memory increase the speed of your printer?; limitations on the number of files floppy disks can hold; naming a file through a cell in Microsoft Excel 5.0; creating unique temporary filenames in Microsoft Access; and more. *Page 267.*



the hood, Microsoft has supplied an OLE DB provider for Index Server and includes samples for customizing search pages using Active Server Pages (ASP), ActiveX Data Objects (ADO), and SQL queries. The Option Pack also integrates ADO with Remote Data Service (RDS), previously known as Advanced Data Connector (ADC).

INTEGRATED SYSTEM ADMINISTRATION

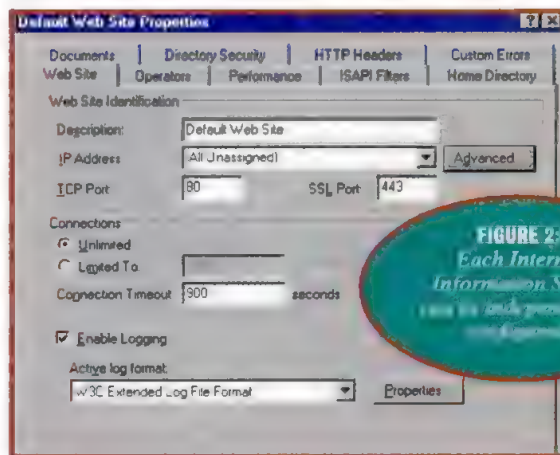
Perhaps the most obvious feature of the Option Pack is the switch to the new Microsoft Management Console (MMC, formerly code-named "Slate") for system administration from the previous standalone host applications. MMC provides an Explorer-like interface for a wide range of system services. In the Option Pack, these include Internet Information Server (IIS), Microsoft Transaction Server (MTS), Index Server, and ActiveX controls; in Windows NT 5.0, everything from Control Panel applets to Performance Monitor will run inside MMC. Ultimately, Microsoft sees MMC as managing directory services, network services, job scheduling, event reporting, performance monitoring, and user environments.

MMC is merely a shell that hosts utilities (called *snap-ins*), ActiveX controls, and even HTML rendering (for site viewing but also for integrated documentation). Most snap-ins can be configured to manage services on any machine, local or remote. Folders can be used to arrange items hierarchically and custom views can be combined into a "console," saved for later reuse, or even distributed to other system administrators or users. Figure 1 shows MMC configured to administer IIS on two machines, MTS on three machines, and a local Index Server. It also highlights the subtle differences in implementation among these three snap-ins. The figure also shows an HTML viewer and a sample ActiveX control, the calendar control from Microsoft Access.

INTERNET INFORMATION SERVER

The central component of the Option Pack is Version 4.0 of Internet Information Server (code-named "K2"), which includes substantial new features and makes production Web servers more scalable and robust. There's something for everyone in IIS 4.0: Web site administrators will appreciate the new security and administration features, developers will welcome the new process-configuration and debugging features, and many organizations will take advantage of the integration with Microsoft Transaction Server to create powerful server-based applications on their Web sites. A single installation of IIS now supports multiple Web and FTP sites. While this might seem to be of interest mostly to Internet ser-

vice providers (ISPs), it means that you can have public, private, and development Web sites on a single server. All that's required is that one of the three attributes that define each site—host header name, IP address, and



Certificate Server) as well as IP address and domain name restrictions. Several new options help improve site administration. For instance, each site can have its own *Web site operators*—composed of Windows NT user

accounts and groups—with limited administrative privileges. Also, support for the new W3C Extended Log Format means that individual event properties can be configured, and turning off logging for a subdirectory makes it possible to log only page hits—thus dramatically reducing the size of log files. Most of the other features (many of which can also be set on a virtual-directory basis) will be self-evident to experienced Web operators. Custom HTTP errors, for

example, allow an administrator to map each HTTP 1.1 error to the default HTTP error message, an HTML file, or a URL. This makes it easy to enhance a standard error, such as "404 (Not Found)," to redirect a user to a modified version of the site's Search page.

Other enhancements have been made behind the scenes. A new Metabase maintains configuration information as well as properties on a per file basis, allowing caching and increasing overall performance. Unfortunately, existing applications (like Exchange 5.0) that install filters using the Windows Registry will

TCP port—must be unique. Since server Secure Sockets Layer (SSL) certificates contain the host name, secure sites must have unique IP addresses (though they may be bound to any port). Each installation of IIS also provides the ability to limit bandwidth for all Web and FTP sites on the machine it's running on.

Web sites now have many more configuration options (see Figure 2). Default options, set for all sites, can be overridden on each. Options that can be configured for each site include:

- home directory (a local or remote share or a redirected URL);
- process isolation;
- performance tuning for expected hits;
- bandwidth throttling;
- operators;
- default ASP language;
- ASP script debugging;
- ISAPI filters (including ordering);
- event logging;
- security permissions;
- content indexing;
- multiple default documents (and ordering);
- automatic document footer (logo, copyright, contact information, and so on);
- automatic content expiration;
- custom HTTP headers;
- Recreational Software Advisory Council (RSAC) content ratings.

It's important to note that bandwidth throttling only applies to static pages: ISAPI DLLs and ASP pages are not affected by this setting. Site security still offers the same options (anonymous access, basic authentication, Windows NT challenge response) but the configuration dialog is now much clearer. Secure communications can also be enabled using certificates (see the section below on



have to be updated to use the Metabase. IIS 4.0 also uses the new FrontPage 98 server extensions. For organizations wanting to get a head start on working with Microsoft's new Active Directory, there's also an Active Directory Service Interfaces (ADSI) namespace provider for IIS.

IIS 4.0 also ships with limited Internet mail (SMTP) and news (NNTP) components. The SMTP component allows the server to send and receive mail messages (perhaps in response to a system event, such as a hardware failure) but supports only a single mailbox. Of course, installing this component disables other SMTP servers, such as the Microsoft Exchange Internet Mail Service. The NNTP component is similarly limited. It doesn't support news feeds (as for Usenet news) or replication, though it's still useful for local discussions for anyone who has a news-reader client.

APPLICATION SCALABILITY (TRANSACTIONS) Microsoft Transaction Server manages component-based applications that involve transactions. A transaction is a group of data operations that succeed or fail as a whole. The classic example is the transfer of money from one ac-

count to another. You must make sure both the debit *and* the credit occur to prevent creating or losing money and thus compromising data integrity. In the traditional n-tier client/server model, MTS encapsulates the middle-tier business logic and manages the client and back-end resource interactions. An MTS package is a collection of related components that run in the same process and trust each other. The package includes the core business logic, and MTS automatically handles much of the application's plumbing, including object request queuing, connection management, thread synchronization, and process context and security. MTS packages are automatically scaled as additional hardware resources are added. Future versions of MTS will perform automatic thread pooling and load balancing.

The Option Pack includes version 2.0 of MTS, which provides some important improvements over the preceding version, which shipped in early 1997. MTS is now integrated into MMC, which handles package deployment and configuration and allows control of individual server processes. Figure 3 shows a snapshot of the transaction

statistics for a sample bank application running with four concurrent clients. MTS 2.0 includes support for the X/Open XA transaction protocol for working with DB2 and Informix as well as enhanced support for Oracle through a new ODBC driver. In addition, MTS now works with DCOM by intercepting calls to COM objects running under MTS. Support has also been added for Microsoft Clustering Server (MSCS), which

provides automatic failover of MTS packages for high availability. Finally, MTS 2.0 provides a scriptable interface for package installation.

Another service included in the Option Pack is Microsoft Message Queue server (MSMQ), which first shipped with the Enterprise Edition of Windows NT Server 4.0. MSMQ provides prioritized store-and-forward message queuing, routing, and security. Message queuing enables MSMQ to integrate with transaction-based applications to provide guaranteed, ordered delivery and confirmation

messages. The version of MSMQ in the Option Pack offers slightly reduced functionality. It has less advanced routing (Enterprise uses "smart" routing based on physical network topology), doesn't do session concentration, and cannot function as a site gate, and its license is for a maximum of 25 concurrent sessions.

The most important transaction feature in the Option Pack is the integration of MTS and IIS. Microsoft calls IIS 4.0 the first "transactional Web server," by which it means that most of a Web server application's processing can be handled by MTS packages running on

that server. When a server page containing script code is declared to be transactional using the @TRANSACTION directive, any components instantiated by the page are run under MTS. And MTS also provides an event-based programming model, so scripts can

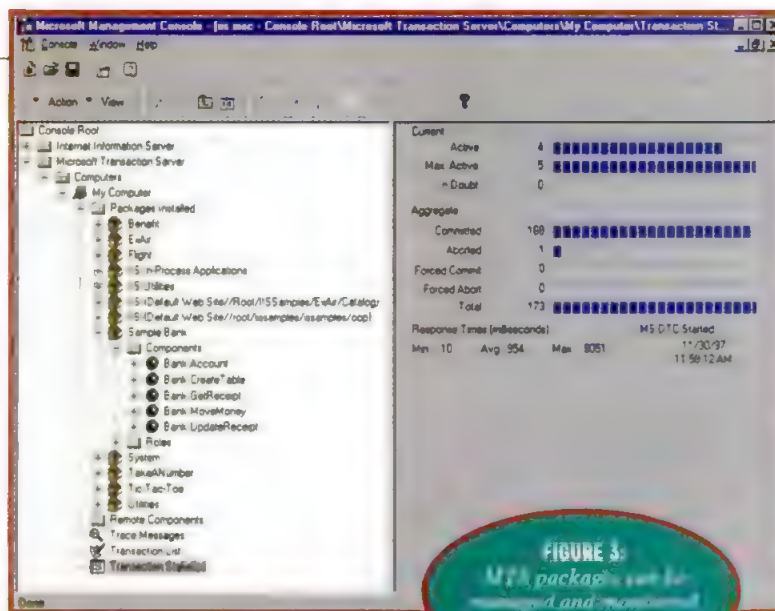


FIGURE 3:
MTS packages can be
deployed and managed
using the MMC



FIGURE 1:
The MMC can
be used to administer
local and remote
installations of IIS, MTS,
and Index Server

**MTS is now
integrated into
MMC, which
handles package
deployment and
configuration and
allows control of
individual server
processes.**



respond to Commit and Abort events. Yet another benefit of running application code inside MTS is the isolation and crash protection provided by separate MTS processes.

CERTIFICATES AND SECURITY

Microsoft Certificate Server creates and manages industry-standard digital certificates. Many communications and networking services rely on digital certificates to provide the foundation for authentication, integrity,

and privacy for exchanged information such as e-mail and Web-based transactions. While all of these features come under the general heading of security, each has distinct purposes: *Authentication* verifies that senders of information are who they say they are (it's trivial to lie

using the popular SMTP mail protocol); *integrity* ensures that information hasn't been altered since it was created (particularly important when a virus can be embedded in an executable file); and *privacy* allows only the sender and authorized recipients to be able to read or use an item.

Certificates are based on a hierarchical trust relationship. At the highest (or *root*) level, certificate authorities (CAs) like Verisign and GTE grant certificates to other organizations, which may use those certificates or, acting as a CA in turn, create additional certificates for other users. There is no single ultimate authority. Any organization can set itself up as a root CA: all that's required is that it "self-sign" a certificate. This practice, however, runs into problems when it's necessary to exchange secure information between organizations. An organization might use its own self-signed certificates for moving information between offices across an unsecure network such as the Internet, but a software publisher who hopes to deal with thousands of external organizations will want to go to the trouble and expense of getting a publisher certificate from a major certificate authority like Verisign. Another wrinkle is getting a CA to show up in a client's list of authorities: Internet Explorer, for example, ships with more than a dozen, and an organization that redistributes IE can use the IE Administration Kit to add its own site.

CertSrv is used primarily for creating, renewing, and revoking server and client cer-

tificates. CertSrv can also create certificates that identify CAs (including root CAs), which are sometimes called site certificates. The certificate contains the public key necessary to validate digital signatures on, for instance, client and server certificates created by that site. While creating certificates is a straightforward process involving a public-key encryption algorithm, a handful of command line utilities, and a back-end certificate authority service, getting those certificates in-

stalled for use on client machines is a bit trickier. Fortunately, CertSrv comes with a sample Web-based distribution mechanism using an underlying ActiveX control that copies a CA certificate onto a client and allows the client to

request and install client certificates.

Web communications can be made secure using SSL 3.0. Figure 4 shows how this is enabled for a site or virtual directory in IIS. Checking *Require Secure Channel when accessing this resource* forces users to access using HTTPS (the "S" stands for "secure"). A new feature in IIS 4.0 is the ability to map client certificates to Windows NT user accounts. If that's not granular enough, further control can be obtained by using ASP scripts to read the contents of the presented certificates.

INTERNET CONNECTIVITY (RAS/VPN)

Internet Connection Services for RAS, new with the Option Pack, is used for setting up a secure virtual private network (VPN) over an insecure public network using Point to Point Tunneling Protocol (PTTP). With Internet Connection Services for RAS, Microsoft has centralized PPTP configuration, scaled it to work with much larger installations, and provided support for distributed security. It consists of three components:

- Internet Authentication Services (IAS);

- Connection Manager Administration Kit (CMAC);
- Connection Point Services.

Internet Authentication Server (IAS) provides authentication, authorization, and accounting services for private corporate networks using the Remote Authentication Dial-In User Service (RADIUS) protocol. RADIUS—a protocol for distributed security developed by Livingston Enterprises—allows (multihop) pass-through authentication for building trust relationships and is particularly useful when a remote user—connecting through an ISP—needs to be authenticated against a separate network. IAS supports PAP and MS-CHAP authentication protocols.

The weak point in PPTP, which is notoriously difficult to get working, has been client configuration, which relied heavily on the RAS phone book. This solution lacked flexibility for mobile users needing access from multiple locations and was especially a problem for large organizations. The new Connection Manager is a customized dialer that replaces the RAS phone book. It is configured using a wizard in the Connection Manager Administration Kit and then distributed to users through Connection Point Services, a phone-book creation and distribution system. This new system integrates public and private phone books as well as phone books from multiple ISPs.

SITE SERVER EXPRESS

The Option Pack also comes with a suite of tools called Site Server Express, a scaled-

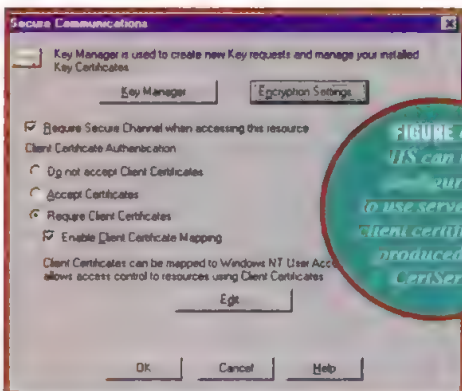
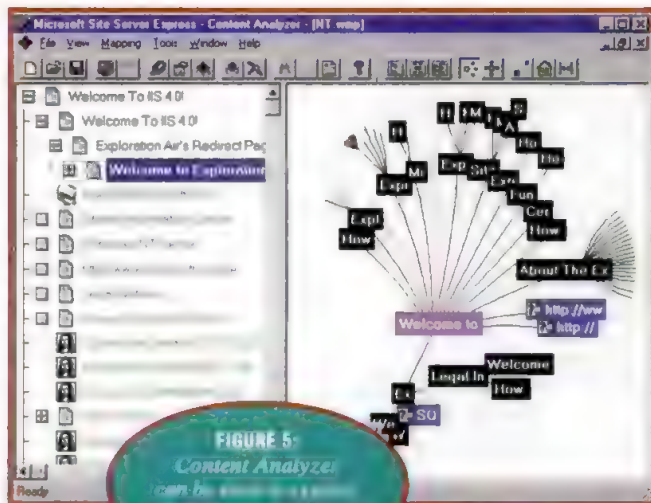


FIGURE 4: IIS can be configured to use server and client certificates produced by CertSrv.



down version of Microsoft's Site Server including Content Analyzer; Usage Import and Report Writer; and the Web Publishing Wizard and Posting Acceptor. Content Analyzer starts by crawling a site using HTTP to generate a WebMap for the site. The WebMap (see Fig-

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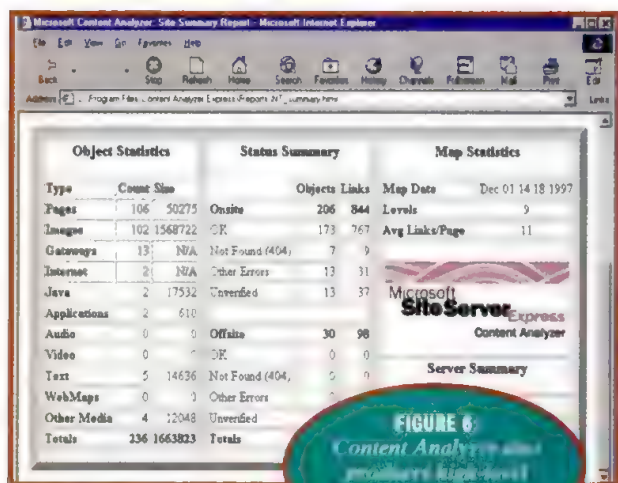


FIGURE 6
Content Analyzer also produces detailed snapshots of Web sites.

ure 5) contains a familiar hierarchical TreeView of the site's content as well as an adjustable "cyberbolic" view, which can be interactively dragged around to explore the various links. Content Analyzer also generates a set of linked HTML reports that summarizes the site's resources (see Figure 6) and allows drilling down into individual resources. Content Analyzer is a scaled-down version of Site Server's Site Analyst tool, which comes with additional pre-configured HTML reports, support for custom searches, and enhanced analysis capabilities.

Usage Import and Report Writer, the base components of Site Server's Usage Analyst, are used to analyze the traffic on a given site. Usage Import imports data from common Web logs, analyzes the data to identify visits, users, and organizations, and stores the results in a database. Report Writer produces HTML reports that detail traffic by browser, content, geography, hits, organization, referred, request, user, and visit. Site Server's Usage Analyst adds support for numerous additional log formats and a wide range of preconfigured analysis reports.

The Web Posting Acceptor—taken straight from Site Server—is a Web server add-on that allows Web authors to push content onto a site using an industry-standard HTTP POST. A sample ASP script demonstrates post-processing of uploaded files. There are a couple of options for getting the content to the Web server. An included ActiveX Upload Control—used on the client either on a Web page or from a custom application—allows drag-and-drop posting of files. Microsoft's Web Publishing Wizard, which is included with many Mi-

crosoft products including IE 4.0, leads end users through the process of publishing their Web pages, support files, and other Web content either locally (over a LAN) or across the Internet. One additional feature of the full Site Server is the Content Replication System for staging, testing, and publishing Web content to multiple Web servers.

SCRIPTING

Scripting is becoming much more tightly integrated into the operating system.

VBScript and JScript (Microsoft's version of JavaScript) have been available on the client side since IE 3.0 and on the server beginning with IIS 3.0. The Windows NT 4.0 Option Pack includes Version 3.0 of VBScript and JScript, a new scripting host built into the operating system called the Windows Scripting Host, and the new Script Debugger. At the same time, many services in the operating system have new scriptable object interfaces. While the updates to Microsoft's scripting engines are relatively minor (one new feature in VBScript 3.0 is the new FileSystemObject for working with drives, paths, folders, and files), the Script Debugger and new scripting host offer important new functionality.

The Option Pack is the first product to ship with the Windows Scripting Host, which has been available for some time on Microsoft's Web site (www.microsoft.com/management/wsh.htm) for both Windows 95 and Windows NT. Windows Scripting Host allows the operating system to host any ActiveX scripting

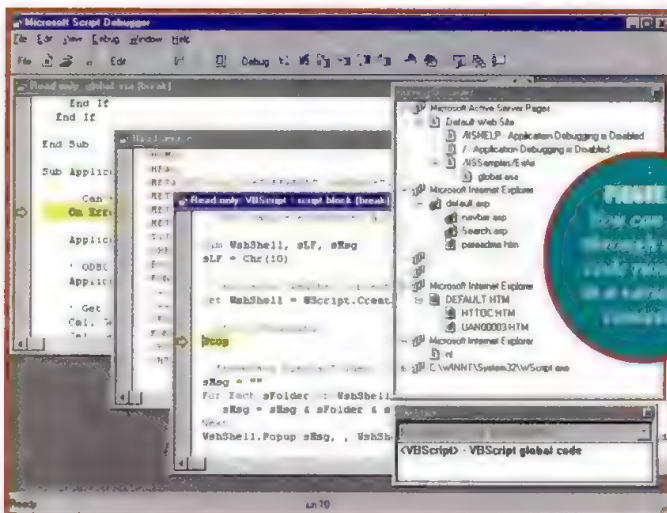
language. Third parties have shipped scripting engines like PerlScript (www.activeware.com), Python, and REXX, and Sun is working on an ActiveX Script version of tcl. As the name implies, Windows Scripting Host scripts can be run in either a Windows-based host (which produces output via message boxes) or a command shell-based host. The base object model allows scripts to work with the system Registry, registered printers, network connections, Windows shortcuts, and network-related properties like ComputerName, UserDomain, and UserName. Windows Scripting Host also provides GetObject and CreateObject methods for working with object servers—for instance, Microsoft's ActiveX Directory—registered on the local system.

The Script Debugger, which can also be found on the Microsoft Web site at www.microsoft.com/scripting, can debug any scripts running on the local machine. If the local machine is running IIS, then that includes ASP scripts running on the Web server. Stepping into scripts running inside IE or IIS is straightforward: Debugging can be configured in IE from the *Advanced* tab in *Internet Options* and by *Application* (a specially configured virtual directory) within IIS 4.0. For Windows Scripting Host scripts, it's handy to include either a Stop statement to automatically break into the debugger or a Wsh.Shell.Popup to allow you to set this option manually each time the script is run. Figure 7 shows the Script Debugger stepping through script code running in three separate places: IIS, IE, and Windows Scripting Host.

SUMMARY

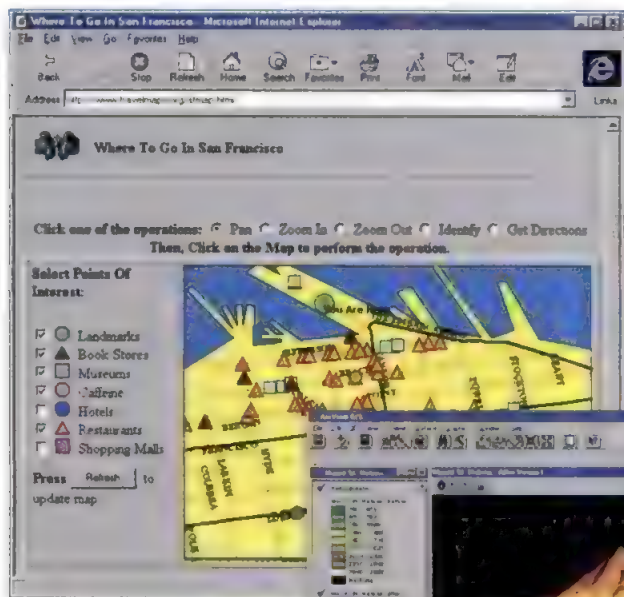
The Windows NT 4.0 Option Pack encompasses a number of important components. While it will be extremely rare for a specific installation to run *all* of these services, by integrating them into the operating system Microsoft is moving toward having a complete enterprise operating system in a single package. A follow-on resource kit, with additional documentation and samples, will help developers build larger and more complex systems than were previously possible using the Windows platform. **PC**

Keith Pleas is an independent author, developer, and trainer. He organizes and speaks at technical conferences and is also a contributing editor for Visual Basic Programmer's Journal and Windows NT Magazine.

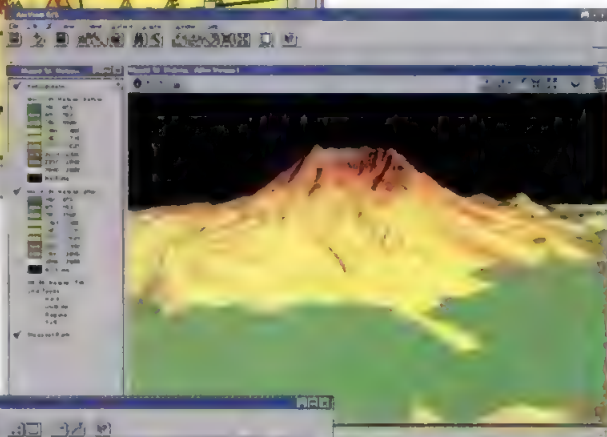


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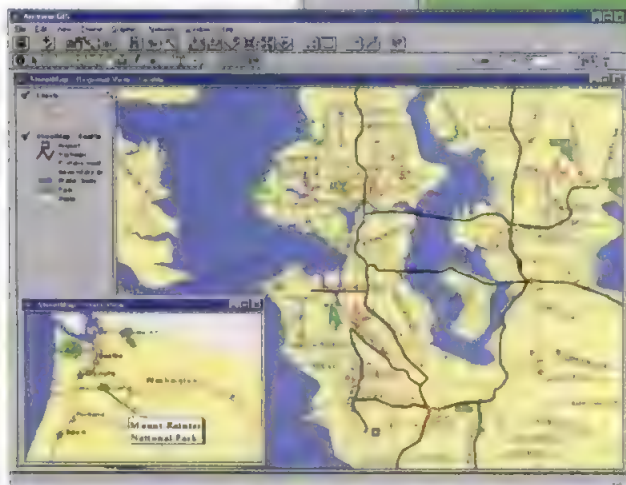
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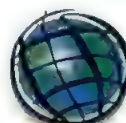


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The Ultimate Multimedia Lego Set

The Java Media Framework can accommodate current and future multimedia applications.

By Linden de Carmo

Our examination of Java's multimedia APIs ("Java and Digital Audio: An Excellent Brew," August 1996) revealed that they had tremendous potential but that serious work was required to make them useful. Since that article was written, Sun has released a new Java-based multimedia architecture called the Java Media Framework (JMF). Does this overhaul address the issues we raised in our last article? Can it compete with native multimedia APIs in Windows, Unix, and OS/2? In this article, we'll not only answer these questions but explore the new features available in JMF.

The original Java multimedia support was inadequate for serious multimedia development, and the quickest solution would have been to patch Java to address specific problems. This approach would have eventually resulted in a disorganized mess, because the original interface was not extensible. Therefore, Sun decided to collaborate with Intel and Silicon Graphics to create JMF—an API that could accommodate current and future multimedia applications. JMF was specifically designed for the following application categories: Media Display, Media Capture, and Media Collaboration.

JMF's Media Display classes enable you to play digital audio, digital video, MIDI, and other multimedia content. Its Media Capture classes will allow you to record and save content from microphones, cameras, and other sources of multimedia data. The Media Collaboration classes promise the capability to write telephony, videoconferencing, and other collaborative applications. Because the first release of JMF only supports the Media Display classes, we'll be focusing on their capabilities and the ways you can incorporate them into your programs.

Java is known for its portability—the ability to run the same executable on numerous operating systems. Similarly, JMF provides multimedia portability: The same JMF classes may be used to play a wide variety of multimedia content, such as .AVI, QuickTime, .WAV, and AIFF files. This portability is enabled by a multimedia framework, or careful-

ly designed set of classes, designed to support the common features found in the presentation of a wide variety of multimedia data files.

Sun has targeted three types of programmers with JMF: *client*, *enhancement*, and *system-level*. The first and most common type of programmer is at the client level. This type of programmer writes high-level multimedia applications and usually is not interested in a complex API. As a result, JMF offers a powerful yet easy-to-understand interface. Java also provides built-in user interface controls for manipulating multimedia data. As a result, even the most artistically challenged programmer can rapidly create an attractive multimedia presentation.

The second programmer category is that of the enhancer. Enhancers need to tweak certain aspects of multimedia playback. For instance, an enhancer will often want to improve performance of a video compression/decompression routine in a media player.

The final kind of programmer is the system-level programmer. Designers override JMF's

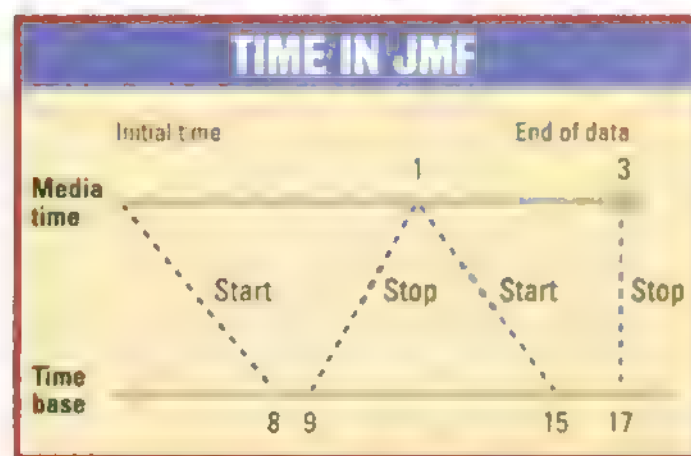


FIGURE 1: Each Java Media Player has two time representations.

low-level methods in order to create Media Players. The beauty of JMF's object-oriented multimedia framework is that designers do not have to rewrite players completely. Rather, they only need to replace specific methods with those required to enable playback of their multimedia data.

The Java Media Player is the core object used in this release of JMF and is responsible for retrieving and processing media, then presenting it at the appropriate time. Each Java Media Player object implements methods defined by four interfaces: Clock, Controller

(which extends Clock), Duration, and Player (which extends Controller and Clock).

The Clock interface is the heart of a Java Media Player. Every beat controls when the player presents data and also how it performs synchronization (synchronization ensures that two or more media streams are presented at the same playback speed). Each Java Media Player uses two different representations of time: a *time base* and *media time*. A time base, or flow of time from a specific original point in time, is very similar to a time-of-day clock—it never stops ticking. For example, Greenwich mean time is a time base, since it has a known origin and involves an uninterrupted flow of time.

By contrast, media time is like a stopwatch, because it constantly starts and stops as the player starts and stops the presentation. The media time represents the amount of time consumed in the data stream associated with the media player. The example in Figure 1 shows that during a stop condition, the player's media time remained constant at 1, while the time base continued to advance to 15. When playback was resumed, both the media time and the time base continued to increase. A Media Player validates its internal media time with a time base in order to synchronize with other players.

A Controller object is an extension (a subclass) of the Clock object, and it enables your application to receive event notification and to manipulate system resources. The Player object builds on the Controller to provide user controls, for an easy-to-use interface. Finally, you can use the Duration object to determine how long a data source will play.

Like the previous audio API, JMF locates media files via a Uniform Resource Locator (or URL). However, JMF enhances URL support by classifying the reliability of the transport mechanism used to transmit the data. (For a detailed discussion of reliability, the Real-time Transport Protocol, and the Internet Engineering Task Force, see "Internet Telephone Standards," *PC Magazine*, February 18, 1997.)

A data source is classified as *pull*, meaning the client controls the flow of data, or *push*, indicating that the data comes in continuously whether or not the client receives every packet. Once an application senses which of these categories a data source belongs to, it can determine which APIs are legal and what the capabilities of the player are. For example, if you're using a media player to display a broadcast HDTV stream, then the stream is being pushed toward you and the broadcast will continue without further requests from the user.

Java Media Players are amazingly simple

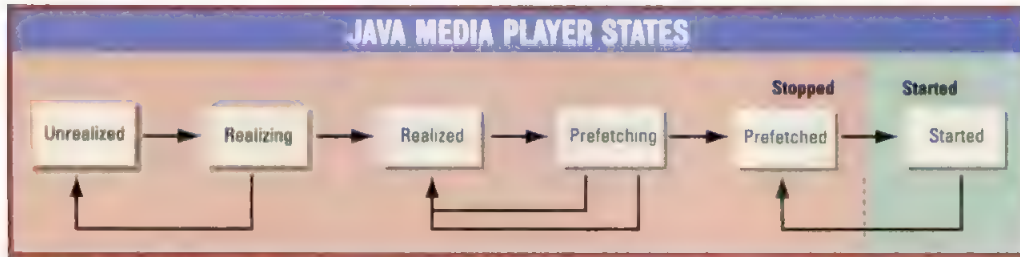


FIGURE 2: A Java Media Player is always in one of the six states shown here.

and predictable: They are always in either stopped or started state. Players in the stopped state are not playing data, whereas players in the started state are presenting data. For the Controller interface of a player, however, the stopped state is divided into a finer granularity of five substates: unrealized, realizing, realized, prefetching, and prefetched (see Figure 2).

A Media Player enters the unrealized state when you request that it load a URL. In order to play a media file, the player must acquire system resources (such as an audio device to play a .WAV). While the player is determining and acquiring the resources required to present the data, it enters the realizing state. After the realizing process is completed, the player is said to be realized. At this point in time, user interface elements may be displayed by the player.

When an application requests that a player enter prefetching state, it finally acquires the system resources necessary to render the presentation. Before it enters prefetching state, the player can't prevent other players from starting. However, once it arrives at prefetched state, it can own resources (such as a hardware MPEG-2 device) and thus prevent other players from running. After the player reaches prefetched state, you can issue the `player.start()` method to start the presentation (this also shifts the player into the started state).

Like most modern multimedia subsystems (such as Microsoft's DirectShow), JMF utilizes events for asynchronous communication (asynchronous commands execute and complete without your supervision or control, often on their own threads). Each Java Media Player provides a `ControllerListener` interface, which you can use to monitor events (events can contain information about errors, attribute changes, and other modifications to the player). One interesting feature of this class is its ability to notify you of the player's state transition gyrations. These are the possible state-transition events under JMF:

StartEvent
StopEvent
DeallocateEvent
EndOfMediaEvent
RestartingEvent
StopAtTimeEvent
StopByRequestEvent

The `ControllerListener` interface not only helps you understand the inner workings of a media player but is the only way to avoid state command exceptions (see Figure 3). Certain Media Player commands are available only in specific states. For example, trying to change the playback rate on an unrealized player will cause an exception. Fortunately, because the `ControllerListener` alerts you to state transitions, you can avoid such problems.

Java Media Players can include other Controller objects besides the `ControllerListener`, to define other control behaviors.

```

public void init()
{
    setLayout(new BorderLayout());
    String mediaFile = getParameter("FILE");
    try {
        URL mediaURL = new URL(getDocumentBase(), mediaFile);
        player = Manager.createPlayer(mediaURL);

        // this call lets us listen to state transition events (among other
        // things)
        player.addControllerListener(this);
    } catch (Exception e)
    {
        System.err.println("Failed to create player"+e);
    }

    public synchronized void controllerUpdate(ControllerEvent event)
    {
        if (event instanceof RealizeCompleteEvent)
        {
            // realized complete processing goes here!!!
        }
    }
}

```



FIGURE 3: Illustration of using the `ControllerListener`. The applet's `init()` method creates a Player object and attaches a `ControllerListener` to it. Events are received in the `controllerUpdate` method.

One intriguing controller is the `CachingControl`. Downloading multimedia data files over the Internet (or even a local network) can take an agonizingly long amount of time. During this download period, inexperienced or impatient users may feel that their applications have hung. The `CachingControl` averts this problem by displaying a progress bar to inform users of the download status.

Because it is impossible for Sun to anticipate and define control interfaces for all future multimedia players, JMF enables custom controllers via subclassing. For instance, a Dolby Digital (AC-3) player could create a controller that allowed the user to manipulate Dolby Digital settings such as surround sound, karaoke, and subwoofer.

Now that you understand how Java Media Players operate, it is time to examine the methods used to write an applet. After you create a player object, you invoke the `getVisualComponent` to retrieve the default user interface associated with the player. Once your visual controls are retrieved, you can use the following methods to manipulate media playback: `Player.realize`, `Player.prefetch`, `Player.start`, `Player.stop`, and `Player.deallocate`.

The `Player.realize` method informs the

PrefetchCompleteEvent
RealizeCompleteEvent

player that it should enter the realizing state. You can then utilize `Player.prefetch` to force the player into prefetching state. By ensuring that the player is in prefetching state, you minimize the amount of time required for `Player.start` to begin the presentation. Since both `Player.realize` and `Player.prefetch` are asynchronous, the player posts a `RealizeCompleteEvent` and `PrefetchCompleteEvent` respectively when the requested calls complete. While a prefetched player is indeed ready to play immediately, it

be able to synchronize separate data sources. A presentation may require the simultaneous playback of .WAV, .AVI, and digital audio from a CD-ROM. Since many existing operating systems are unable to synchronize separate multimedia devices, cross-platform applications have had to perform this synchronization themselves. Fortunately, this is no longer necessary, since JMF provides a novel solution to this problem: *managed players*.

MANAGED PLAYERS

The concept of managed players gives you a way to define the secondary (managed) players that will be controlled by the primary (managing) player (see Figure 4). The managing player is responsible for synchronizing the different media times in each managed player and also for forwarding all commands to managed players (this is very similar to OS/2's *synchronized group* concept). If you use the managing player's `Player.start`, it will automatically issue `Player.start` to all managed players.

Managed players handle events in a slightly different manner from that of conventional players. A managed player alerts you to an event only after every player's controller has posted the event. This scheme greatly reduces your workload, since you only need to track the state of the managing player, not the states of multiple players.

After reading about JMF's elegant architecture, you probably still have one burning question: How does it perform? Because Java programs are stored in platform-independent byte codes, many early Java multimedia programs resorted to the use of native methods to overcome performance woes.

Recently, Sun has been extolling the importance of writing 100 Percent Pure Java programs (100 Percent Pure programs contain no native code). As a result, the viability of native code-enhanced multimedia has been in question. Fortunately, Sun seems to be more tolerant about the use of native code in JMF. In fact, although creating a 100 Percent Pure JMF player is theoretically possible, Sun implicitly acknowledges that writing a performance-sensitive JMF player virtually requires native code.

Now that we've reviewed the features available in JMF, it's time to analyze whether Sun has addressed the weaknesses we discovered in our original Java multimedia article. The initial version of Java only supported Mu-law and could not play the more popular Pulse Code Modulation (or PCM) data. Not only does JMF let you play .PCM audio files, but the architecture is flexible enough to support a variety of other audio compression technologies.

In addition, the original Java didn't offer

programmers the ability to determine the current playback position, or even to determine if playback was completed! JMF removes these limitations with methods to determine media position, media length, and playback status.

The initial multimedia API also had no support for digital movies, audio recording, CD audio, and a host of other basic multimedia features. JMF directly supports playback of .AVI, QuickTime, and MPEG movie files. While there is no explicit audio-recording capability, the promised Java Media Capture and Conference APIs should theoretically remove this limitation. Furthermore, JMF's extensible nature ensures that CD audio support can easily be incorporated by any vendor.

But there are still wrinkles that need to be ironed out. Though there is an extensive amount of documentation for client programmers, there is virtually no reference material for enhancers and system-level programmers in the current revision of the JMF documentation. Furthermore, JMF shares one flaw with its predecessor—the reliance on future releases to solve today's problems. Until the Media Capture and Media Conference classes are released, JMF will still not be as functional as the native multimedia services found in Windows 95, Windows NT, Unix, and OS/2.

FURTHER INFORMATION

If you are interested in creating JMF-enabled applets or applications, you can download the "Java Media Player Specification" and "Java Media Player Guide" at java.sun.com:80/products/javamedia/jmf/index.html. If you are using Windows 95 or Windows NT, you can retrieve Intel's "Java Media Framework Package" from www.intel.com/ial/jmedia/JMFramework.htm. Silicon Graphics users can get their version of JMF, known as CosmoMotion, at www.sgi.com/cosmo/motion/index.html.

Sun also sponsors a JMF e-mail interest list. You can subscribe to it by sending e-mail to javamedia-request@sun.com with the following line in the message body: `subscribe jmf-interest`.

The Java Media Framework is a tremendous advance over the original Java multimedia API. It has an object-oriented, easy-to-use architecture that has been designed to accommodate a variety of present and future media types. Although the framework is still in a state of evolution, the initial release provides an impressive environment for multimedia programmers. **PC**

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FIGURE 4: Managing players remove the complexity of simultaneously controlling multiple players by automatically forwarding requests (such as `Player.start`) and pooling events for all players.

also ties up system resources and may prevent other players from functioning.

After you invoke the `Player.start` method, the player begins the media presentation process. Fortunately, if you're careless and fail to use `Player.start` while the player is in prefetching state, the `Player.start` method will automatically perform the realization and prefetching. The `setMediaTime` method can be used to tell the player at what point in time you wish to begin playback. You can also use the `setRate` method to modify how fast playback occurs (positive numbers increase forward playback speed, whereas negative numbers increase backward, or rewind, playback speed).

Once playback has begun, `Player.stop` may be called to stop the player. There are situations where you may wish to play only a specific amount of data. In these scenarios, you should inform the player of the exact point in time you wish to stop playback, via `setStopTime`.

The `Player.deallocate` method informs the player that it can return all exclusive resources to the system. Using `Player.deallocate` is essential when your program is in an idle condition, because the program may be preventing other applications from using the player; prefetched media players may also consume large quantities of memory.

Sophisticated multimedia applications must

Read On-Screen Documents with Ease

Scroller lets you scroll windows automatically at the speed of your choice.

By Gregory A. Wolking

The demands of scrolling long documents for on-screen reading can be an annoying distraction. You read a window's worth of text, and then you must stop reading, aim the mouse, click the scroll bar, find your place in the document, and then do it all again when you're ready for more text. While that may be tolerable for short documents, the frequent interruptions make it difficult to focus on content when you're reading long documents. This issue's utility, Scroller, provides a solution. You simply select the window that you want to read, you click Scroller's *Start* button, and it scrolls the window for you, line by line, at a rate you specify.

Scroller is a 32-bit application that runs under Windows 95 and Windows NT 4.0. You can obtain the program by download from PC Magazine Online or by mail. Refer to the sidebar "Getting the Files" for details. The source code for Scroller, which was written in Microsoft Visual C++, is also provided for programmers interested in seeing how it works.

USING SCROLLER

To install Scroller, place its files (Scroller.exe, Scroller.hlp, and Scroller.cnt) into the directory of your choice and create a shortcut to Scroller.exe. Scroller neither creates nor uses any external files, and the only data it places in the Registry is its own private user settings. If you decide to remove Scroller from your system, first launch it (either from a DOS window or with the Start menu's *Run* command), and specify the `/uninstall` switch on the command line. When Scroller has removed its data from the Registry, you may delete the program files, as well as the hidden .GID and .FTS files WinHelp may have created.

When you launch Scroller, the only active control is the finder icon, which you use to identify the window you want to scroll. Drag the icon from Scroller's dialog. As you move the icon around the screen, Scroller will draw an outline around each window as the icon passes over it. When your desired window is outlined, release the left mouse button to select it and Scroller's dialog will change as shown in the top two panels of Figure 1, which shows both the standard and the tiny interface options.

To begin scrolling, click the *Start* button.

Scroller

Scroller makes it easy to read long documents on-screen by automatically scrolling a window. You can scroll forward or backward, and you can set the scrolling speed. Scroller runs under Windows 95 and Windows NT 4.0.



The caption (or image) on the *Start* button changes and the finder icon disappears; you must stop scrolling before you can select a different window. To change the scrolling direction, click the *Reverse* button. To stop scrolling, click the *Stop* button. While the target window is scrolling, it responds to your input. If you close the target window while it is scrolling, Scroller resets itself automatically.

To change the speed at which the window

scrolls, click on the *Speed* field's spin control and use the Up and Down Arrow keys to change the speed incrementally. Alternatively, if Scroller is not in tiny mode, you can tab to the *Speed* field, type a number manually, and press Enter. The speed setting ranges from 0 (slowest) to 500 (fastest). Scroller scrolls one "click" at a time, where each click is equivalent to clicking the arrow at the top or bottom of the window's scroll bar, or moving the mouse wheel by one "notch" in either direction. The speed setting represents the interval between clicks in hundredths of a second. At maximum speed, the interval is one-tenth of a second. At minimum speed, it's 5.1 seconds.

To change Scroller's other settings, point either to a button or to the finder icon and click the right mouse button to open the context menu. Three settings are available. *Always On Top* determines whether Scroller's dialog floats above any other windows. *Emulate Mouse Wheel* determines which method Scroller will use to scroll the target application. When the option is disabled, the target window scrolls as if you were clicking its vertical scroll bar with the mouse. When the option is enabled, the window scrolls as if you were rotating the wheel on a Microsoft IntelliMouse. You do not have to have an IntelliMouse installed to use this option; it works with any application written to recognize the mouse wheel. You will find that some applications work with one method but not the other (more on this below).

The *Tiny View* setting determines the size of Scroller's dialog. When Scroller is in tiny view, the mouse behaves differently. Since the dialog does not have a title bar, you move the window by clicking anywhere *except* on a button or control, then dragging the window to the desired position. To activate the System menu, either press Alt+<Spacebar> or right-click on Scroller's taskbar button. You can exit the program using the *Exit* command on either menu, or by pressing Alt-F4.

Scroller automatically saves its settings to the Registry, so it will remember them when you restart the program. If you need help with any of Scroller's functions, press F1 or select the *Help Topics* command from the context or system menu.

FOR PROGRAMMERS ONLY Scroller is a 32-bit Windows application written in C++ with MFC (Microsoft Foundation Classes). It can be compiled with Microsoft Visual C++ 5.0. The full source code, available from PC Magazine Online (www.pcmag.com), demonstrates several interesting programming techniques, including:

- how to let users select a window using a "finder icon" and a rectangular highlight border;
- how to let users move a window that has no title bar;
- how to simulate the Microsoft IntelliMouse on a system that doesn't have one.

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FINE POINTS OF SCROLLING

Different applications implement scrolling in different ways. The most important point to understand is the literal definition of the term *window*. Almost all graphical objects on the screen, including buttons and edit fields, are technically considered separate windows. Therefore, what appears to be a single window is often a composite of many individual windows. That's why Scroller outlines the target window as you drag its finder icon. Some applications, such as Microsoft Word, have scroll bars that are separate windows. Others, such as Notepad, have scroll bars that are integral parts of single windows. To complicate the situation further, the relationship between a scroll bar object and the window it controls can vary widely. Some applications, such as the main browser window in Microsoft Internet Explorer 4.0, do not recognize standard scroll bar messages at all. The only way Scroller can control these applications is by emulating the mouse wheel.

Scroller cannot discern how any given application implements scrolling. Therefore, you may have to experiment with your window selection and the *Emulate Mouse Wheel* setting to find a combination that works with any given application. If *Emulate Mouse Wheel* is turned off, you should try dropping the finder icon on these areas (ordered from most to least reliable):

1. the vertical scroll bar that controls the target window;
2. the client area of the target window;
3. the title bar of the document window (for multiple-document applications);
4. the title bar of the application's main window.

If the application recognizes the mouse wheel and *Emulate Mouse Wheel* is turned on, scrolling usually works if you drop the finder icon on the title bar of the application's main window. With most multiple-document applications, such as Word, the document window that scrolls will be the last one you activated. In fact, you can change which document window is scrolling by clicking the window's title bar to bring it to the foreground. That is the only situation in which you can change the target window on the fly.

INSIDE SCROLLER

Scroller is a multithreaded application written with Microsoft Visual C++, Version 5.0, and the Microsoft Foundation Classes library (MFC). I built the basic application using the MFC AppWizard. Scroller works by posting messages (WM_VSCROLL or WM_MOUSEWHEEL) to the target window. The messages are posted by a separate thread, so that the

actual scrolling mechanism runs independently of the main dialog. That makes the timing of those messages more consistent and makes the main dialog more responsive to user input.

Like all Windows messages, WM_VSCROLL includes two parameters. The first contains the window handle of the scroll bar control that has generated the message. The second parameter contains information about how to scroll (up or down, by one line, or by one segment). Some applications—such as Notepad, whose scroll bar is not a separate window—ignore the first parameter entirely. Others, such as Word, require that the handle represent the proper scroll bar window. Therefore, it is important for Scroller at least to try to provide the proper value for that parameter when the utility posts the WM_VSCROLL message to the target window.

The WM_MOUSEWHEEL message is not quite as picky. Its parameters tell the target application which way the wheel moved, how far it moved, where the mouse pointer was when the wheel moved (which the application may or may not use), and whether any Shift keys were held down at the time. When Scroller composes a WM_MOUSEWHEEL message, it fakes the mouse position, based on the target window's client rectangle. The program calculates the coordinates as if the mouse were at dead center in the window. Regardless of the message used, Scroller has to be able to determine which window the user wants to scroll.

THE WINDOW FINDER

In designing Scroller, the first hurdle I had to overcome was how to give the user a way to select which window to scroll. One method might be to generate a list of visible windows on the system and let the user choose one. Such a list could be huge, however, and trying to determine which window is the right one would be virtually impossible, so I decided to let the user select the window visually.

I borrowed an idea from the diagnostic tool Spy++, which is bundled with Visual C++: the "window finder," a graphical object that a user can drag from the dialog and drop onto the target window. I created my window finder using two separate but interrelated mechanisms. The first, driven by mouse event handlers, displays the finder icon in place of the mouse cursor. The second, driven by a timer, draws a rectangle around the perimeter of each window the finder icon travels over.

First I created a static image control in the main dialog containing the finder icon. (Although I refer to it as an icon, it's actually a 16-color bitmap, which requires a little less memory than an icon and simplifies the code

for dragging the image around the screen.) In addition to displaying the bitmap in the static control, I load it into a CImageList object, m_imgFinder, which does most of the work when you move the image around the screen.

When the user clicks the left mouse button, the OnLButtonDown handler checks the mouse coordinates to see if the cursor is on the finder image control. If it is, the handler sets a flag to indicate that a drag operation is in progress, so that the other mouse event handlers can

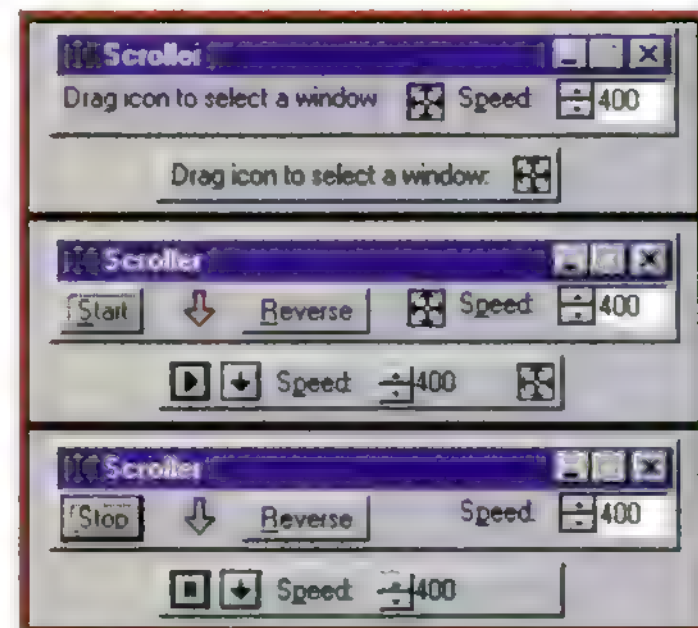


FIGURE 1: The appearance of Scroller's dialog depends on whether a window has been selected and whether scrolling is in progress, in addition to the Tiny View setting.

alter their behavior appropriately. For example, OnMouseMove moves the drag image to the new mouse location only if this flag is set. OnLButtonDown then hides the mouse pointer and calls the appropriate CImageList member functions to initialize the finder bitmap, set its "hot spot" to the center of the image, and display it in place of the mouse pointer. Next OnLButtonDown calls the API function SetCapture, so that the dialog will receive all further mouse input until the user releases the mouse button to end the drag operation.

Once this is done, OnLButtonDown creates a CWindowDC object to obtain a device context for the desktop window for drawing the finder's outline rectangles. Device contexts are limited resources. If a device context is not available, the constructor for CWindowDC throws a CResourceException, which a try...catch block catches to prevent Scroller from crashing. This lets the finder icon function but without outlining the windows as the icon moves.

Once OnLButtonDown has obtained and verified the device context pointer, it prepares to track the window as the pointer moves. The variable m_hWndNewTarget holds the handle of the window under the mouse, and m_hWndOldTarget holds the handle of the window that was previously under the mouse. OnLButtonDown initializes both window handles to NULL, then creates a timer to fire at intervals of 100


```
void CScrollbarDlg::OnTimer(UINT nIDEvent)
{
    CPoint ptMouse;
    HWND hWnd;

    // Make sure we have a device context!
    if (m_pDeskDC != NULL)
    {
        // Find out where the mouse is.
        GetCursorPos(&ptMouse);
        // Get handle to the window the mouse is over.
        hWnd = ::WindowFromPoint(ptMouse);
        // If successful,
        if (hWnd != NULL)
        {
            // Set new target window
            m_hWndNewTarget = hWnd;
            // and get its screen coordinates.
            ::GetWindowRect(hWnd, &m_rectNewTarget);
            // Hide the finder bitmap.
            m_imgFinder.DragShowNoLock(FALSE);
            // If we have already drawn an outline,
            if (m_hWndOldTarget != NULL)
            {
                // and user is pointing at a different window,
                if (m_hWndOldTarget != m_hWndNewTarget)
                {
                    // erase the old outline and draw the new one.
                    m_pDeskDC->DrawDragRect(&m_rectNewTarget,
                        CSize(2,2),
                        &m_rectOldTarget, CSize(2,2));
                }
                else // Otherwise, draw a new outline.
                {
                    m_pDeskDC->DrawDragRect(&m_rectNewTarget,
                        CSize(2, 2),
                        NULL, CSize(2, 2));
                }
                m_imgFinder.DragShowNoLock(TRUE);
                // Restore the finder icon.
                m_hWndOldTarget = m_hWndNewTarget;
                // Save the window handle
                m_rectOldTarget = m_rectNewTarget;
                // and its coordinates.
            }
        }
    }
}
```



FIGURE 2: The OnTimer handler draws an outline around the target window.

milliseconds (one-tenth of a second). The timer will be used to highlight the window under the mouse cursor.

As the user moves the mouse, the OnMouseMove handler erases and redraws the finder icon so that it follows the mouse position. While this is going on, the timer is sending WM_TIMER messages every 100 milliseconds. When the OnTimer handler (see Figure 2) receives the WM_TIMER message, it calls GetCursorPos to obtain the coordinates of the mouse. To retrieve the handle of the window the mouse is over, it passes that information to the Windows API function WindowFromPoint and then stores the handle in the m_hWndNewTarget member variable.

The OnTimer handler then calls GetWindowRect to obtain the coordinates of the window's border and stores those coordinates in the m_rectNewTarget member variable. Next OnTimer calls the image list's DragShowNoLock member function to hide the finder icon, so that it won't interfere with the outline rectangles as they are drawn or erased. OnTimer then checks to see if the m_hWndOldTarget handle is NULL; if it is, a rectangle hasn't been drawn yet, so the handler draws a new rectangle around the specified coordinates by calling the CWindowDC object's DrawDragRect member function, with the parameter lprectLast set to NULL.

If m_hWndOldTarget is not NULL, the handler compares it with m_hWndNewTarget to see if the user is pointing at a different window. If so, the handler calls DrawDragRect, with the para-

meter lprectLast pointing to m_rectOldTarget. This erases the rectangle around the previous window and draws a new rectangle around the current one. Finally, the handler calls DragShowNoLock again to restore the finder icon and copies the new window handles and rectangles to the old ones for use with the next WM_TIMER message.

I could have incorporated the rectangle-drawing mechanism directly into the OnMouseMove handler. That would have made the code less complex, but it would also have placed a much greater processing load on the system, since the program would check to see whether it should redraw the drag rectangle every time the system sent a mouse-move notification—which can be substantially more often than once every tenth of a second.

When the user releases the left mouse button, the OnLButtonUp handler stores the mouse coordinates, erases the finder icon, restores the mouse pointer, and calls ReleaseCapture to restore normal mouse operation. If necessary, the handler calls DrawDragRect to erase the last outline rectangle and then deletes the CWindowDC object to release the device context and its resources. Finally, the handler posts a private WM_MY_VALIDATE message to the dialog, so it can process the mouse coordinates after the OnLButtonUp handler returns.

The OnMyValidate handler uses the coordinates stored by OnLButtonUp to determine which window the finder was on. (I didn't use the same handles as with the outline rectangle

mechanism, because if a device context was unavailable, those handles would not have been maintained.) If the finder is over Scroller's own window, the OnMyValidate handler resets the dialog to its "no window selected" state.

Otherwise, if the *Emulate Mouse Wheel* option is turned off, Scroller tries to determine whether the target window contains a scroll bar control. First, it checks to see if the target window is a scroll bar. If so, the program gets the handle to the scroll bar's parent window and sets m_hWndTarget and m_hWndScrollBar accordingly. If the target window is not a scroll bar, the program searches through the sibling windows to see if any of them is a vertical scroll bar, and if so, it stores the appropriate window handles. If it can't find a vertical scroll bar at all, it sets m_hWndScrollBar to NULL.

THE SCROLLER THREAD

My first design for the scrolling mechanism used a system timer to post a WM_VSCROLL or WM_MOUSEWHEEL message repeatedly at the specified interval. That didn't work very well; the interval between "virtual clicks" of the scroll bar was somewhat erratic, especially at faster scrolling speeds, and the dialog box was sometimes unresponsive to user input. Therefore, I decided to use a separate thread to do the actual scrolling and used the ClassWizard to create a CScrollerThread class.

CScrollerThread is a nearly direct derivative of CWinThread. The only difference is in CScrollerThread's Run loop. A standard

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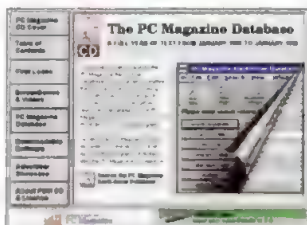
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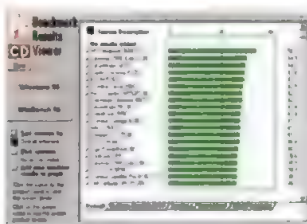
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CWinThread's Run loop spends most of its time in the idle state, waiting for a message to be placed in its message queue. CScrollerThread's Run loop enters the idle state only when Scroller is not scrolling. Otherwise, it loops continuously.

On each pass through the loop, the thread tests the target window handle to make sure the window still exists. If the window is gone, the thread posts the private message WM_MY_WINDOW_GONE to the main dialog and returns to its idle state. Otherwise, it posts the appropriate message to the target window and calls the Sleep function to wait for a specified interval before making another pass through the loop. When the main dialog receives the WM_MY_WINDOW_GONE message, its OnMyWindowGone handler resets it to the "scrolling stopped, no window selected" state, ready for the user to select a different window.

The result is that CScrollerThread runs continuously while Scroller is loaded but requires very little processing overhead. It spends most of its time waiting for a message to be posted by the main application or sleeping between scrolling events. To avoid synchronization problems, the CScrollerThread object maintains separate copies of the data it needs (window handles, speed setting, and so on). The main application posts private messages to the thread to tell it to start scrolling, stop scrolling, change the scrolling speed or direction, or terminate. The parameters passed with each message contain the relevant data for each function.

CHANGING THE VIEW

When you design a dialog resource in Developer Studio's dialog editor, the coordinates it displays are in "dialog units." At run time, the size of a dialog unit varies, depending on the user's screen resolution and font size settings. Therefore, whenever Scroller resizes a con-

trol or the main dialog, it sets the desired size in dialog units and calls MapDialogRect to convert dialog units to screen units (pixels) based on the user's current settings. That ensures the dialog's controls will maintain the proper relative size and position, regardless of the user's display settings.

The job of shifting the dialog's appearance between normal and tiny is done in the Adjust_Layout function. To display (or hide) the dialog's title bar, it calls CDialog::ModifyStyle to add (or remove) the WS_CAPTION style. After displaying, hiding, and moving the dialog's controls appropriately, Adjust_Layout sets the desired size of the dialog's client area in dialog units, converts them to pixels with the function MapDialogRect, calls CalcWindowRect to determine the overall window size based on the client area, and calls SetWindowPos to resize the dialog.

The tricky part is handling the spin button control. A spin button control can be attached to an edit control or static text control (known as a "buddy window") so that the spin control automatically sets the text in the control it's attached to. When the dialog is in normal view, the Speed field is an edit control. But an edit control can't be sized small enough to fit in the tiny dialog, so I use a static text control instead. Rather than create separate spin button controls for both, I used a single spin control, attached it to a CSpinControl member variable, and used CSpinControl::SetBuddy to attach the spin control to the edit control or the static text control, as needed.

The nice thing about SetBuddy is that it automatically shrinks the specified buddy window to make room for the spin buttons. The drawback is that if the spin button was already attached to a different buddy window, SetBuddy doesn't restore that buddy window to its original size and position. So without special measures, each time a user changed views, the Speed fields would move

to the right and get smaller and smaller until completely invisible. To solve this problem, Adjust_Layout sets the desired size and position of the edit control or label before calling SetBuddy to attach the spin control.

MOVING THE TINY-VIEW WINDOW

The final step is to give the user a way to move the tiny-view window. In normal view, the user can move the window by dragging its title bar, just as with any other window. In tiny view, there is no title bar for the user to drag.

To work around this problem, I overrode the dialog's WM_NCHITTEST handler. The system posts WM_NCHITTEST messages to each top-level window whenever the user moves or clicks the mouse with the pointer over the window. The value returned by the window's WM_NCHITTEST handler tells the system which area of the window (such as the title bar, the client area, or a sizing border) the pointer is over.

When Scroller's dialog is in tiny view, my OnNcHitTest handler checks the mouse coordinates to see if the user is pointing directly at a control. If not, it returns HTCAPTION, which fools the system into thinking the user is pointing at the dialog's title bar—even though the dialog doesn't have one. Thus the user can drag the window by pointing the mouse anywhere except directly on a control, and I didn't need to write code to implement the dragging manually.

Once you get Scroller "dialed into" your reading speed, you can sit back and read a long document without breaking your concentration to scroll manually. **PC**

Gregory A. Wolking, the author of Scroller, is the primary sysop of the ZNT:Tips Forum on ZDNet/CompuServe and the PC Magazine Utilities discussion area on the Web. Sheryl Canter is the editor of the Utilities column and a contributing editor of PC Magazine.

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User-to-User

BY NEIL J. RUBENKING

Relieving Dial-Up Networking Amnesia

The way to get the latest Dial-Up Networking no longer involves installing the ISDN Accelerator and then removing it. Dial-Up Networking, Version 1.2, is available from Microsoft's Web site. It also comes with Windows 95 OSR2, the version being shipped on new computers. Unfortunately, I found that this new Dial-Up Networking version can still have problems with remembering your password.

The answer lies in a "bug fix" (a new feature) that's provided on the Windows 95 Web site. The fix appears under "Dial-Up Networking Save Password Bug," and it works. There's also an MS Knowledge Base article (Q148925) titled "Dial-Up Networking Password Is Not Saved."

THEODORE B. DOLMATCH
via the Internet

PC MAGAZINE: If you use a dial-up connection to the Internet, you probably make and break that connection a dozen times a day. The process is definitely smoother when you don't have to respond to the password dialog every time. In theory, you can set up DUN to remember the sign-on information and use it without asking. In practice, there are a number of different reasons for this feature to fail:

- Password caching is disabled;
- a DUN file is damaged;
- your password list file (.PWL) is damaged;
- the Rna.pwl file exists and is damaged.

If you're having trouble in this area, the first step is to get the latest DUN from www.microsoft.com. I won't quote a more specific URL or even a specific version number, as either or both may have changed by the time you read this. Install the update and cross your fingers: Your problem may be solved.

If DUN amnesia is still a problem, you'll want to take a look at "Solving the Mysterious Save Password Problem" in the December 2, 1997, issue of *PC Magazine*, which is a detailed discussion of the problems and possible solutions. You may also want to peruse the Knowledge Base article mentioned above. As of this writing, the URL for the article is premium.microsoft.com/support/kb/articles/q148925.asp. It's quite complex and describes several different possible solutions. You'll want to print it off and work through it step by step. I've passed this information to a

number of readers individually, and all have found a cure eventually.

Poor Man's Wake-Up Call

It may not be as nice as a cheerful voice at 6:00 A.M., but you can have your computer wake you up by dialing the phone nearest your bed. I've found it easy to ignore most alarm clocks, but there's some sort of deep-seated psychological aversion to letting the phone ring.

Wakeup.bat dials the specified phone number and lets the phone ring for up to 90 seconds. It simply sends modem command strings to the COM port. The batch file uses the Choice /T command as a fail-safe timer to ensure that the phone goes back on-hook. After you create the batch file, right-click on it in Explorer and select the Close on exit check box under the Program tab in Properties.

You need to run this batch file using a scheduling tool such as System Agent (from the Plus Pack) or Task Scheduler, which comes with IE 4. If you use System Agent, add this as a new task, setting the time and days of the week. You can even set System Agent to keep running the program every few minutes between plenty-of-time-for-a-shower-and-breakfast and splash-water-on-the-face-and-hope-the-traffic's-light.

The S7=90 setting tells the modem how long to let the phone ring without making a connection. If you send +FCLASS=1, it will wake you up with the dulcet strains of a fax machine mating call. At least you'll know it's a modem and not a real person (your boss, for instance).

I use this handy trick myself three times a week. I have System Agent running on my computer at the office, so I just added this as a recurring task. It keeps me from missing important meetings after a dusk-to-dawn programming session.

DAN MERIT
via the Internet

PC MAGAZINE: I made a few minor additions to Wakeup.bat, to ensure that the modem's previous state won't prevent dialing out. The MODE command serves to prepare the modem for use. I set the baud rate to 1,200, but the actual rate is not relevant. And I inserted the standard reset command ATZ into the dialing string.

The variation whereby the modem sends fax handshake tones is naturally possible only if you have a fax modem. Wakeup.bat contains a comment that shows the change you must make to enable this variation. Simply insert +FCLASS=1 in the command string that's sent to the modem, just before DT. The fourth and fifth lines of Wakeup.bat set the default phone number to 555-5555 and the modem communications port to COM2. You'll want to edit these lines to specify your own phone number as the default, and change the communications port to COM1, if that's what your modem uses. If you're having trouble trying to figure out which port is correct, just launch the Modems applet from Control Panel, select the modem, and click on the Properties button.

```
@rem ===== wakeup.bat
@Rem ===== Poor Man's wakeup call
@
@set PhoneNum=5555555
@set ComPort=COM2
@if not (%1)==() set PhoneNum=%1
@if not (%2)==() set ComPort=%2
@
@mode %ComPort% baud=1200
echo >%ComPort% ATZ AT S7=90 DT %PhoneNum%
::If you have a FAX modem, you can change the line above to
::echo >%ComPort% ATZ AT S7=90 +FCLASS=1 DT %PhoneNum%
@choice "Stop Dialing and hang up? " /t:Y,90
@rem ----- make sure the phone goes back on-hook
echo >%ComPort% AT
echo >%ComPort% AT H
exit
```

FIGURE 1: If your computer runs all night, you can schedule this batch file to have it give you a wake-up call.



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HARDWARE

Power to the Printer

I have a new high-resolution ink jet printer that seems to be quite slow when printing. Will a faster CPU or more memory increase the printing speed?

ALEXANDER WONG
via the Internet

PC MAGAZINE: If your printer is one of a newer breed that depends on Windows, then it may benefit from more memory or a faster CPU, because these upgrades can improve Windows performance. Even so, the print speed may well be influenced more by other factors that you should consider before making a large investment in an upgrade.

The starting point is to determine where the processing is taking place for your printer tasks. If your printer can print only from Windows (or within a DOS window) and not from a DOS prompt, then it probably relies on host-based processing. This means that the computer's CPU creates the page image and then sends a data stream to the printer.

By contrast, other printers create the page image more or less on their own. The computer sends a string of commands to the printer, which has its own controller with a processor to interpret those commands that result in the image data. The key way to determine which type of printer you have is by seeing whether or not the printer can print directly from a DOS prompt when Windows is not running. You can test this simply with the command "DIR /W > PRN," which should send the current directory to your printer. If so, then the printer is able to interpret ASCII text characters on its own, without relying on the computer's CPU to translate those into images for it.

If your printer handles its own processing, then a CPU upgrade or additional memory is not likely to have much of an impact on performance. These upgrades may help host-based printers, but this is not certain, because there may be other bottlenecks in your system that have a greater impact on the performance.

Not so long ago, ink jet printers had resolutions no higher than 300 dpi. Today, you can find ink jets with 1,200-dpi or higher resolutions for \$400 or less. A 1,200-by-600 printer requires eight times as much data to print a single square-inch image as a 300-by-300 printer does. Assuming that you have the

same data transmission speed for both printers, it will take eight times as long to move that data from the computer to the printer. If the 300-dpi printer is black and white and the 1,200-by-600 image uses four-color ink to produce full color, then there is four times as much data for the printer to handle per printed dot, or a 32-fold increase overall. It makes sense that this will take more time.

You may be able to speed up the processing by making sure that your computer's parallel port is set to take full advantage of the printer's ability to accept data rapidly. If supported by the printer and computer, set your parallel port to ECP (extended capabilities port) in your computer's CMOS configuration settings to get the best performance; this setting will require the use of a DMA (direct memory access) channel, so make certain that you have one available. (In Windows 95, open Control Panel, then the System applet. Click on the *Device Manager* tab, then double-click on the *Computer* line, and choose the *Direct Memory Access* radio button to see which DMA channels are in use in your system.) If you do not have a free DMA channel, try the EPP (enhanced parallel port) setting if your computer supports it. This will provide transfer rates that are nearly as fast.

The other solution to consider is changing the printer driver settings so that you print images in lower resolution, or use draft mode for all but the final output. These settings reduce the amount of data that must be sent from the computer to the printer, or be processed within the printer, which can also help your printer to work faster.

—Alfred Poor

OPERATING ENVIRONMENTS

When Is a Full Disk Not A Full Disk?

After I started using Microsoft Word for Windows 95, I encountered a problem: I can't save more than 66 files onto a floppy disk. No matter how small the files are, after the 66th I get a message that the file can't be created. I know there is room on my disk, because I check it every time. And I've tried several different disks. I'm wondering whether the problem has something to do with the long names I've been giving my files. Can you please help me with this?

ALBERT JUAREZ
via the Internet

PC MAGAZINE: You're exactly right when you suspect the long filenames. Here's the problem. The root directory of any drive using the FAT file system (standard for DOS, Windows, and Windows 95) has a fixed size. On floppy disks, this size is 112 or 224 directory entries. This occasionally caused problems even in the days before long filenames—more than once I've fielded complaints that this-or-that program reported a floppy disk as full, when the disk's 112 files occupied only half its space.

Long filenames exacerbate the problem because the extra filename information is stored using extra directory entries. Simply including lowercase letters in the name is enough to force the use of two directory entries. As the filename expands past eight characters, additional directory entries hold the overflow.

Luckily, there is a simple solution. You'll have to move at least one file temporarily off your floppy disk. Now create a subdirectory on the disk, restore the moved-off file into the subdirectory, and store all additional files on that disk in the subdirectory. In general, if you create or store numerous files with long file-

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```
Option Compare Database
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```

```
Declare Function GetTempFileName Lib "kernel32" _
Alias "GetTempFileNameA" (ByVal lpzPath As String, _
ByVal lpPrefixString As String, ByVal wUnique As Long, _
ByVal lpTempFileName As String) As Long
```

```
Declare Function GetTempPath Lib "kernel32" _
Alias "GetTempPathA" (ByVal nBufferLength As Long, _
ByVal lpBuffer As String) As Long
```

```
Public Const MAX_PATH = 260
```

```
Public Function GetTmpFile(Optional strFolder As String = ".",
Optional strPrefix As String = "TMP") As String
*****
' Public Function GetTmpFile(strFolder As String, strPrefix As String)
' Returns a unique filename guaranteed by Windows to not be in use.
*****
Dim strFileName As String, lngResult As Long
strFileName = String$(MAX_PATH, 0)
lngResult = GetTempFileName(strFolder, strPrefix, 0, strFileName)
If lngResult <> 0 Then
    GetTmpFile = Left$(strFileName, InStr(strFileName, Chr$(0)) - 1)
Else
    GetTmpFile = vbNullString
End If
End Function
```

```
Public Function GetTmpFolder()
*****
' Public Function GetTmpFolder()
' Returns the "TEMP" folder used for storing temporary files
*****
Dim strFolder As String, lngResult As Long
strFolder = String$(MAX_PATH, 0)
lngResult = GetTempPath(MAX_PATH, strFolder)
If lngResult <> 0 Then
    GetTmpFolder = Left$(strFolder, InStr(strFolder, Chr$(0)) - 1)
Else
    GetTmpFolder = vbNullString
End If
End Function
```

FIGURE 2: The VBA functions *GetTmpFile* and *GetTmpFolder* can be used in your Microsoft Access 95 or 97 programs to create temporary files with unique names.

create the temporary file. For instance, you could use "." for the current directory, or you could pass the results of the Windows function to *GetTempPath*, which returns the path officially designated for temporary files (usually C:\Windows\Temp, as specified by the environment variables TMP or TEMP).

The second argument is a string prefix, the first three characters of which form the beginning of the filename.

The third argument is a numeric switch. If this is 0, *GetTempFileName* uses the system

time to generate a hexadecimal value to use as part of the filename. A value of 0 also tells the API function to check the filename for uniqueness and to keep altering it, if necessary, until a unique name is generated. *GetTempFileName* then creates and closes the file. If the third argument is not 0, the argument itself is used instead of the system time-based hexadecimal value. A nonzero argument also tells the API function to skip the check for uniqueness and skip any attempt to create the file on-disk.

The last argument is a string variable to hold the returned filename. The string must be preinitialized to the maximum possible length of a fully specified filename.

The filename returned by *GetTempFileName* is a concatenation of the path you passed as the first argument, the string prefix, the number generated by the system, and the extension .TMP. Bear in mind that for *GetTempFileName* to work correctly, the drive and folder you pass in the first argument must exist. And don't forget to delete the temporary file when you're finished working with it.

Figure 2 shows an example function called *GetTmpFile*, which puts a wrapper around a call to *GetTempFileName*. You pass it two arguments: the folder in which to create the temporary file and the string prefix to use as the start of the filename. You'll notice that both arguments are optional and have defaults. If you don't specify the folder, it defaults to the current directory. If you leave out the prefix it defaults to TMP. The function returns the name of the temporary file it creates. If it fails to obtain a valid temporary file, the VBA constant *vbNullString* is returned instead.

The function *GetTmpFolder* in Figure 2 can be used to obtain the folder designated for temporary files. It calls the API function *GetTempPath*, which returns the value specified by the environment variable TMP or, if that's not found, the environment variable TEMP. You could use *GetTmpFolder* to obtain the pathname for use as the first argument to *GetTmpFile*, for instance.

The code in Figure 2 can be found in the database *Tmpfil.mdb* on PC Magazine Online. The database is in Microsoft Access 97 format.—*Sal Ricciardi*

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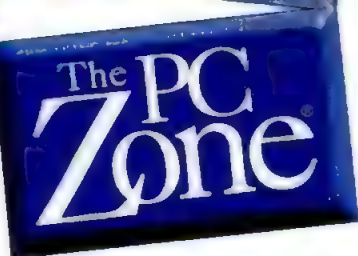
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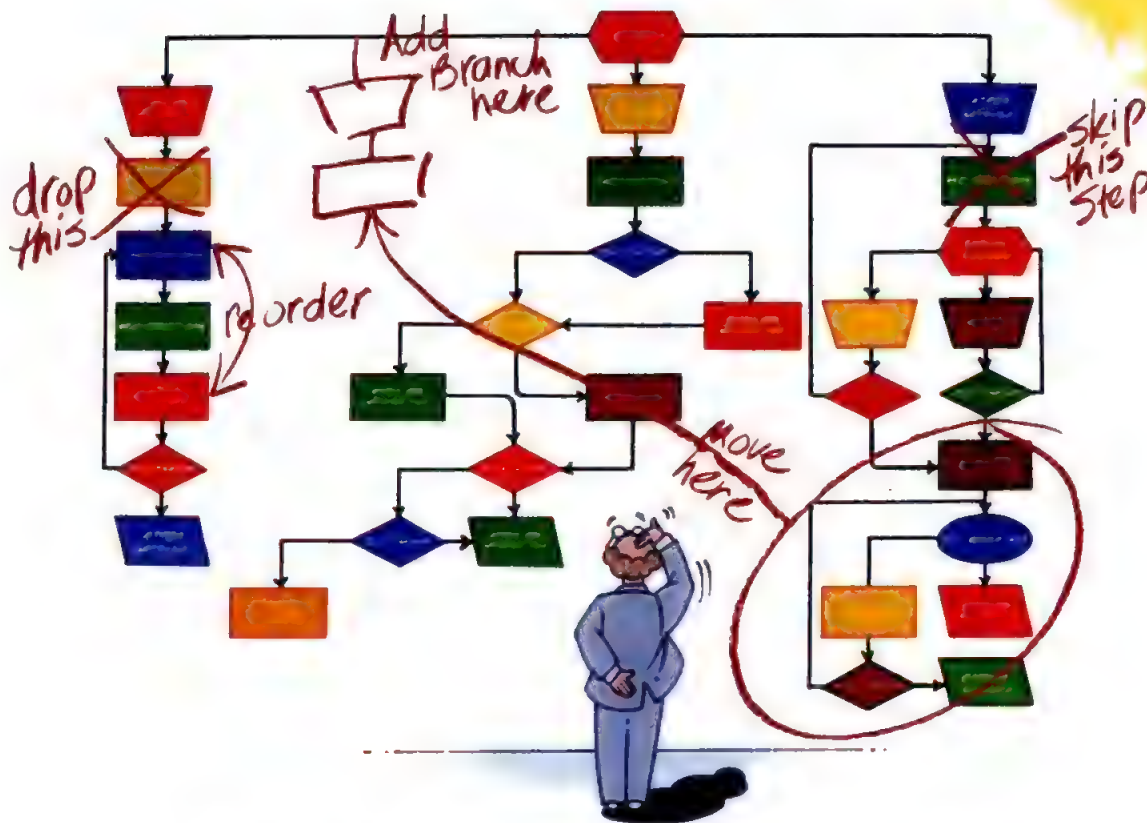
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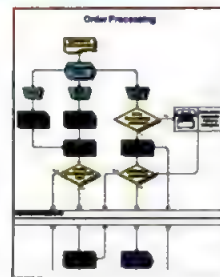
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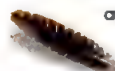
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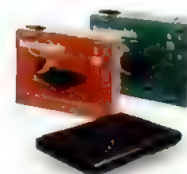


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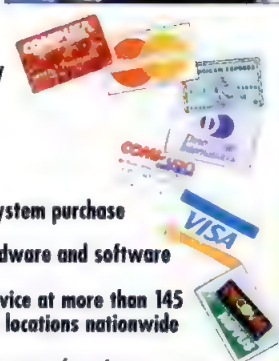
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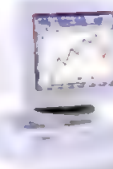
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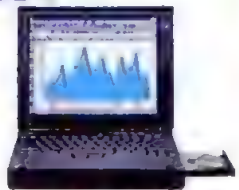
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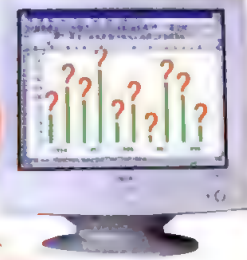
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Pinnacle Micro, Inc. RCD 4X12 External Rewritable CD Drive/SCSI-2	RCD4X12PCA	799.95
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Toshiba - Tecra 7400 7480 7480	PTS-TS01021	PTS-TS01030	PTS-TS01040	PTS-TS01050
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Portege 660	PTS-TS03021	PTS-TS03030	PTS-TS03040	N/A
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Tecra 520 530	PTS-TS06021	PTS-TS06030	PTS-TS06040	N/A
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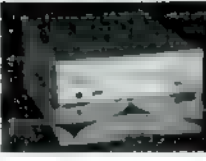
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4551MB	7200	Quantum	XP3455S	\$459
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4551MB	10000	Seagate	ST34551N	\$845
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2275MB	7200	Quantum	XP3227S	\$249
4336MB	5400	IBM	IBM4336N	\$309
4360MB	7200	Western Digital	WD4360W	\$485
4551MB	7200	Quantum	VK3455S	\$345
4551MB	7200	Seagate	ST3455W	\$349
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9100MB	10000	Seagate	ST39101W	\$979
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9100MB	10000	Seagate	ST39101WC	\$129

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2620MB	5400	Fujitsu	MP3021U	\$149
3200MB	5400	Fujitsu	MP3032U	\$179
3227MB	4500	Seagate	ST33232A	\$179
3228MB	5400	Quantum	FB33200A	\$185
3240MB	5200	Maxtor	M83240D	\$185
3249MB	5200	Western Digital	AC23200	\$182
4018MB	4000	Quantum	BF4000A	\$195
4303MB	4500	Seagate	ST34342A	\$209
4304MB	5400	Western Digital	AC34300	\$211
4310MB	5400	Quantum	FB34300A	\$205
4320MB	5200	Maxtor	M84320D	\$205
4370MB	5400	Fujitsu	MP3043U	\$209
5160MB	5400	Western Digital	AC35100	\$234
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24X	Pioneer	DRX24X	90	\$85
24X	Panasonic	CRS85	85	\$85
24X	NEC	CDR1800	95	\$86
24X	Toshiba	XM6102B	85	\$86
32X	Teac	CD532E	84	\$99
32X	Toshiba	XM6202B	80	\$99
32X	NEC	CDR1900	80	\$109

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Speed	Brand	Model	# Disks	Int
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16X	Nakamichi	MJS16A	5	\$149

SCSI CD ROM

Speed	Brand	Model	ms	Int
16X	NEC	CDR1610	100	\$109
20X	Plextor	PX20TS	95	\$189
24X	NEC	CDR1810	85	\$119
32X	Toshiba	XM6201B	85	\$139
32X	Teac	CD532S	85	\$139
32X	Plextor	PX32TS	85	\$229
32X	Plextor	PX32CS	85	\$269

SCSI CD CHANGERS

Speed	Brand	Model	# Disks	Price
16X	Nakamichi	MJS16	5	\$239

SCSI CD TOWERS

Speed	Brand	Model	# Disks	Price
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24X	NEC	85ms	4	\$1139
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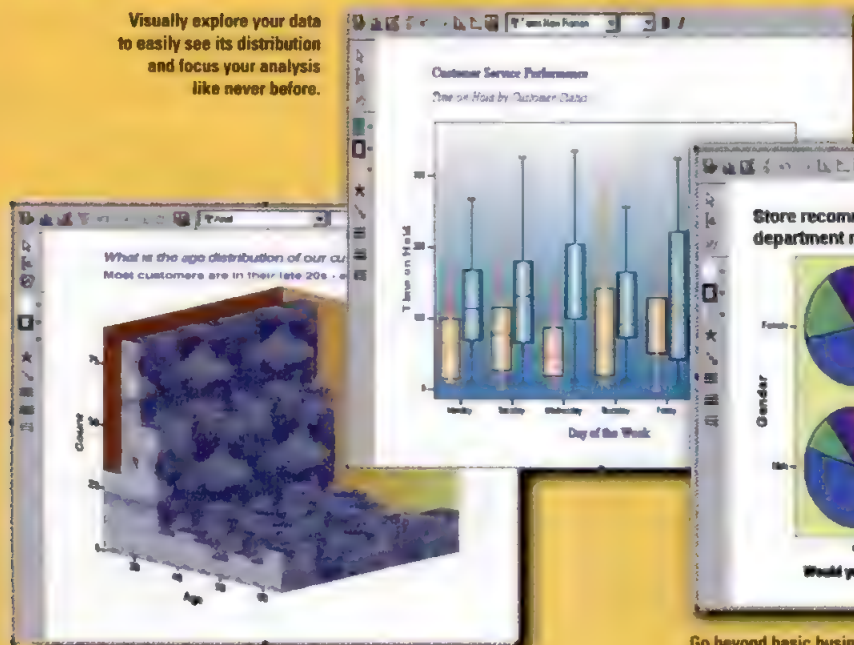
Nakamichi 16X 150ms	\$1349
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Ethernet 7 CD TOWERS

Speed	Brand	Model
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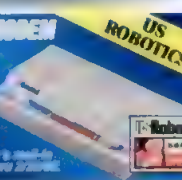
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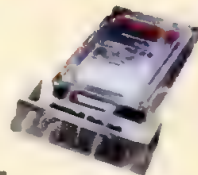
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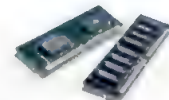
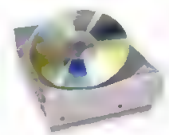
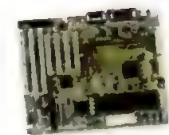
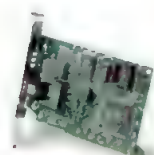
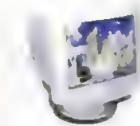
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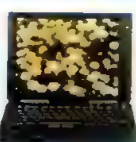
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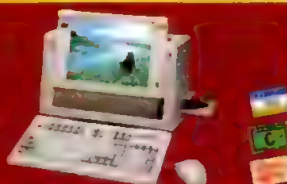
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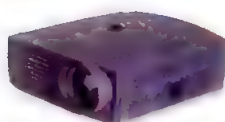
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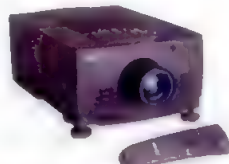
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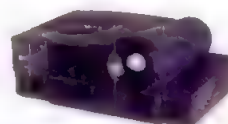


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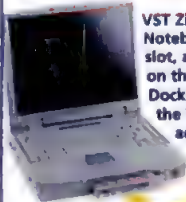
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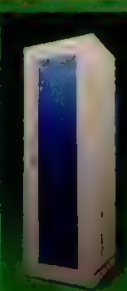
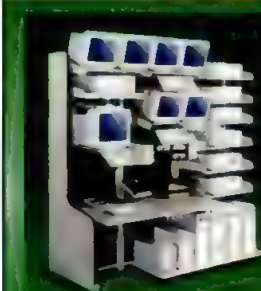
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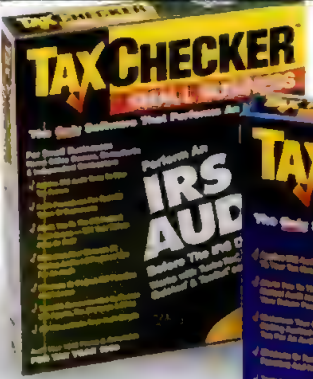
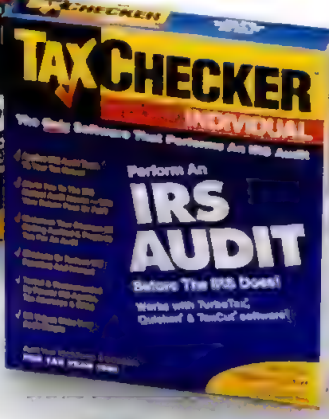
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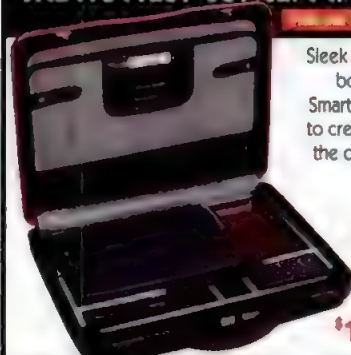
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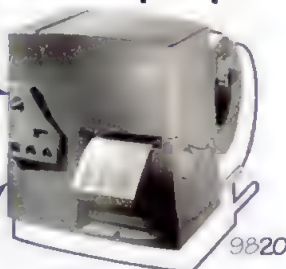


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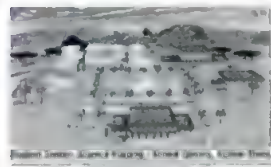
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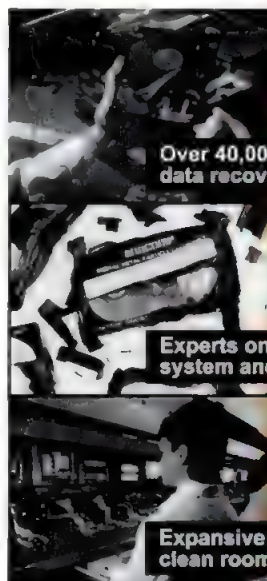
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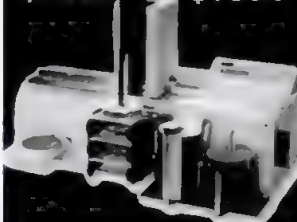
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Safety Patrol

Utilities designed for kids can help your youngster navigate the PC safely.

While it may be true that your kids know more about the computer in the den than you do, it's probably also safe to say that they don't fully understand the hazards—both to themselves and to the computer—that are posed each time they log on. It's not often that the words *software utilities* and *kids* are grouped together, but there are a few programs that fill the bill.

Whether they offer children access to only the applications you selected—Putt-Putt, Spy

ment's Web browser Surf Monkey, however, focuses solely on the Internet. Its goal is to strain out the bad stuff—the pornography, the risqué chat rooms and drug-related sites—and just leave the fun. Here's a look at all three.

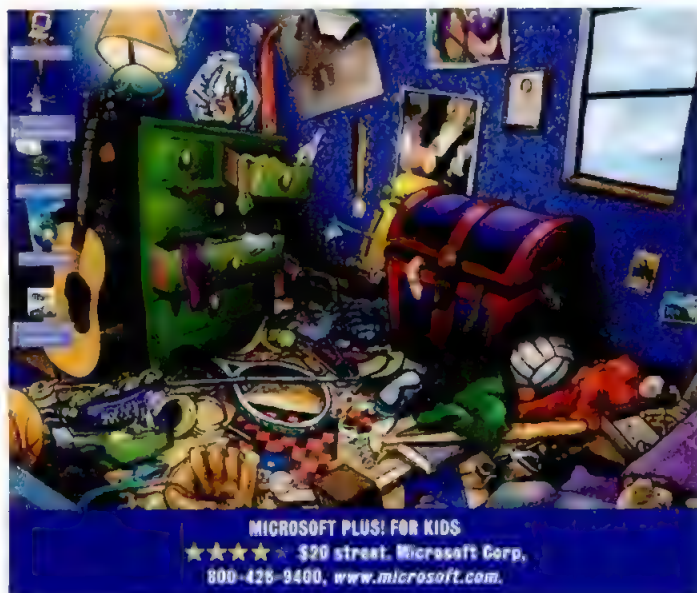
KidDesk Family Edition

KidDesk, designed for kids aged 3 to 10, is not a new product; the first incarnation was launched back in 1992 (that's about a century ago in computer years). However, it has remained a relevant program, and the latest version, KidDesk Family Edition, maintains that tradition.

By providing each child in the household with a personalized PC desktop, KidDesk effectively blocks any access to the "adult" side of computing—the file directories, the system settings, and your personal files.

What's left is just the applications you have selected for your child, ensconced in a kid-oriented environment. KidDesk is launched whenever anyone starts Windows; you need to enter a password to access your conventional desktop.

You begin at the opening screen by entering a child's name in the dialog box labeled *Kid*. Then you can proceed to the Applications dialog box



and choose that child's favorite games or edutainment titles. If you have more than one child, you can create multiple desktops, each with access to different programs. You can also set a Timer Reminder so that kids know how long they have been on the computer.

Once the parental input is out of the way, your kids can have some fun. First they can choose from 12 different desktop motifs, including Sports, Dinosaur, and High Tech. There are also 50 pictures that can be customized using the picture editor, a Paint-type program. Although there are a variety of designs and styles to choose from, we found the graphics a bit simplistic and amateurish compared with many of today's kids' titles.

In addition to the blocking and desktop-design features, KidDesk offers children 11 accessories, including a monthly calendar, e-mail (kids can send messages only to other family members), and a notepad.

Microsoft Plus! For Kids

Where KidDesk focuses on the desktop and Surf Monkey aims at making the Web a safe place to be, Microsoft Plus! For Kids takes the blanket approach and targets both the PC and the Internet. This program, for kids

INSIDE

STILL ROCKIN'

With the release of Quake II, id Software shows that it knows action games like no other action-game developer. *Page 326.*

SLAM DUNK

The thrills and fun of the NBA come to your PC via two new releases—hi-tops not included. *Page 328.*

OFF TO WAR

Grab your gun and put your combat readiness to the test with Civil War Generals 2. *Page 330.*



Fox, or another kid-pleaser—or prevent them from straying into uncharted waters on the Web, these inexpensive, easy-to-use programs go a long way toward easing parents' fears about letting children explore the PC on their own. Edmark's KidDesk Family Edition and Microsoft Plus! For Kids are both all-purpose safety nets between your kids and the computer. Bandai Entertain-

After Hours

aged 3 to 12, is a collection of applications centered around some very hip customized desktops.

Like KidDesk, Microsoft Plus! For Kids lets you create multiple password-protected desktops and restrict a child's access to your hard disk. Once the restrictions are set up and the child has entered his or her desktop, the Windows 95 Start menu shows only the programs to which the child has access. Children can't access Internet Explorer from within Plus! For Kids or alter and delete files.

If you wish to give your children Web access, you can define the sites you want them to visit and then screen out objectionable sites using the Recreational Software Advisory Council (RSAC) rating system, which rates sites for adult language, nudity, sex, and violence. The one problem we experienced here was that if you block access to inappropriate sites, you lose access to sites RSAC has not yet rated, such as the Yahoo! search engine.

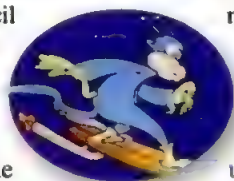
In addition to providing wide-reaching PC protection,

Microsoft Plus! For Kids is heavy on the fun stuff. There are ten eye-popping, cleverly designed desktop themes, from a messy room to underwater sites, space, and a mind-bending, tie-dyed psychedelic motif. Each theme is replete with related cursors, icons, music, and screen savers.

Also included are the child-oriented applications Talk It, Play It, Paint It, and Picture Picker, which invite kids to record their own voices, paint pictures, and compose music on the PC.

Surf Monkey

Seeing a name like Surf Monkey, you can pretty much surmise the age group that Bandai Entertainment is targeting with its new Web browser and online service. The company is a little optimistic in suggesting ages from 8 up, but we're guessing that the 8-to-13 group will find it a blast. And parents will feel comfortable knowing that their kids can browse the Internet under the watchful eye of Surf Monkey (that's the name of both the program and its animated mascot).



Using the Microsoft Internet Explorer 4.0 engine, Surf Monkey acts as a buffer between kids and the Web. A \$29-per-year subscription fee—above and beyond the cost of an ISP account—gets you the browser, regularly updated lists of approved sites, and a monitored, avatar-based chat room (the program uses Microsoft Comic Chat and multimedia e-mail).

The interface resembles the cockpit of a spaceship, with Surf Monkey at the helm. Kids will find the little monkey's banter amusing—and he always

plays the good guy, leaving the character Robbie the Robot to tell kids that they are restricted from a certain site or that they are forbidden to download any files. There are lots of little gadgets in the cockpit to play with, including the Slime and Explode buttons, which let kids "blow up" sites they don't want to look at anymore. For all the fun items embedded in the interface, there's also an educational aspect: A direct link to the Encarta Web site lets kids look up any unfamiliar term they come across.—Jennifer Triverio

Packard Bell's KiddoNet for Surfing Safely

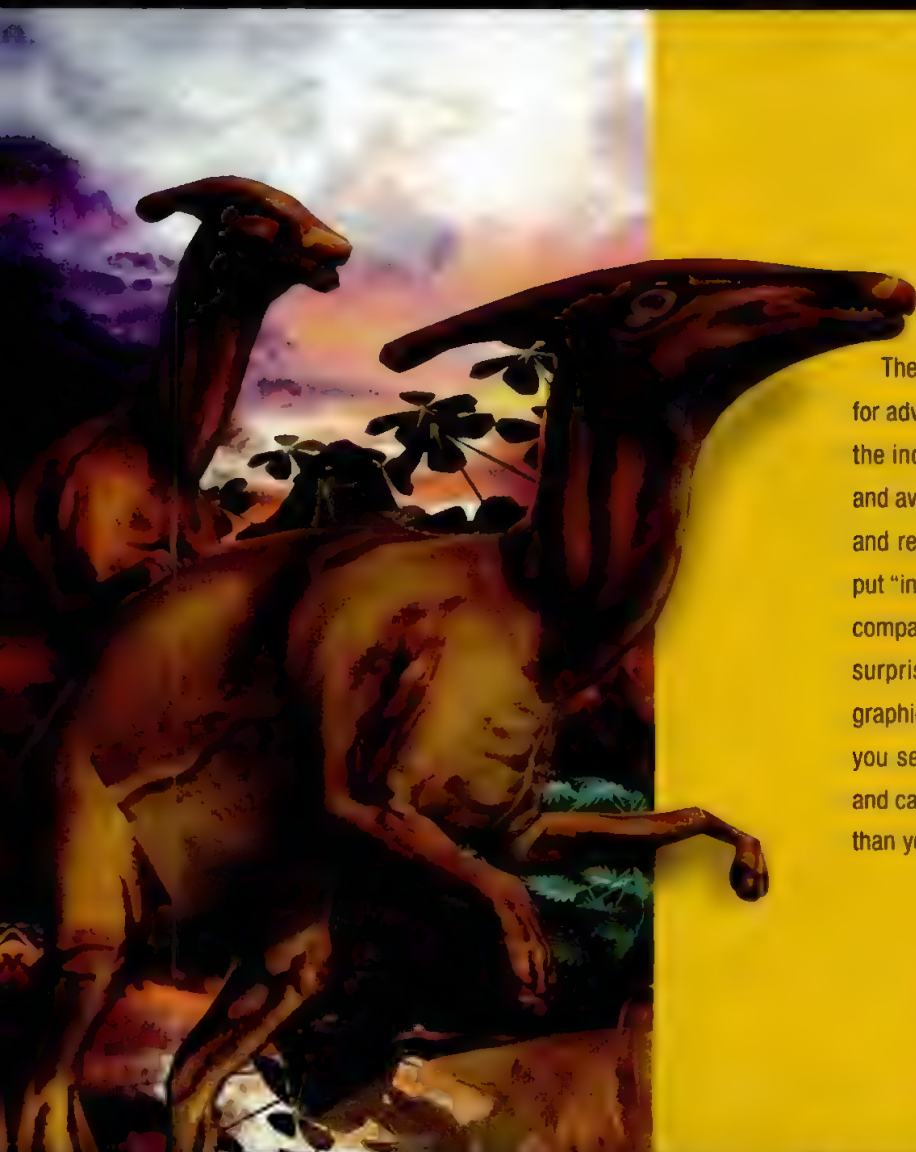
It's a big World (Wide Web) out there, and while children can experience a lot of good wandering through it, you'll no doubt want to shield yours from some of the—how shall we phrase it?—"less refined" areas on the Internet. Packard Bell (800-773-5858, www.packardbell.com) offers parents some peace of mind with its Internet environment KiddoNet, which is designed for kids aged 4 to 8. KiddoNet is available on the company's Platinum and Multimedia PC lines.



With its eye-popping, engaging interface, KiddoNet invites children to surf an ever-changing array of child-friendly Great Sites (so deemed by the folks at Packard Bell). Kids can also visit "My Favorite" Web sites, a list of safe sites that parents create. Links to other sites are blocked, ensuring that your child visits only approved areas.

Kids can also access full-screen cartoons, games, puzzles, and creativity projects right from the main interface. And Packard Bell frequently updates the content.—Jennifer Triverio

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After Hours



id Does It Again

Despite the gore, Quake II is one seriously impressive 3-D action game.

Quake II debuted late last year and immediately stirred up a buying frenzy among devoted gamers. Why did they rush out to buy this title? Because Quake II is quite simply one of the best action games ever created. And although it has more disturbing content than its predecessor, it's an addictive and exciting game.

Published by Activision, Quake II is developer id Software's biggest game to date. It is also the best-designed title the Texas-based company has ever produced.

Like DOOM and Quake before it, Quake II is a first-person action game, known as a "shooter." This time, you're a lone marine trying to survive among an evil alien race called Strogg. A Strogg ambush wipes out the rest of your elite assault force, leaving you in the familiar solo role. All of this is set up in a nicely rendered opening movie, which is something we've never seen before in an id game.

You're faced with a series of mission objectives, each

part of a larger campaign to cripple Strogg military, industrial, and political power. Granted, you still shoot everything in sight, but the well-conceived mission goals give you the feeling that you're taking part in a covert military operation.

Quake II features nearly 40 levels, which are split into 8 combat units. As in Hexen 2, you must move back and forth among levels to accomplish most unit goals. Along the way, you face 18 different types of monsters. Overall, the

creature designs in Quake II are far better than they were in Quake. Also, the bad guys now duck and dodge, and they have multiple attack options at their disposal.

Quake II's weapon selection is superb. The game includes some old favorites, such as the chain gun and rocket launcher, but the new ones are much more useful. We especially liked the hyperblaster, the rail gun, and the updated version of a DOOM classic, the BFG10K.

In fact, much of this game reminded us of the original DOOM series. The weapons, the design of the levels, and the style of the art are all more akin to DOOM's sci-fi look than to Quake's pseudo-medieval style. The outstanding graphics engine, of course, is far more advanced than the

one in either of those games; it features col-

ored lighting, dynamic light sourcing, and level designs.

Quake II does not require 3-D acceleration, but we strongly recommend it. The game does not use Direct3D; instead, it is optimized for OpenGL cards and cards based on the 3Dfx and PowerVR chip sets. Quake II runs on Windows 95 and NT and requires at least a Pentium/90 with 16MB of RAM. We recommend at least a Pentium/166 with 32MB of RAM.

One disappointment was Quake II's lack of multiplayer support. TCP/IP over a LAN or the Internet is the only connection type that it currently supports. It also seems highly unstable over the Internet: It crashed our system nearly every time we exited an online game and often refused to let us join apparently open games. We are confident that id Software will address these issues in a forthcoming patch

since multiplayer support is what most fans crave.

The gore is another aspect that merits a caution. All of id's games are bloody, but this is the bloodiest by far. Some of the levels include

tortured human prisoners who moan and beg you to kill them. Unfortunately, you can't save these people, and if you kill them, you will actually be rewarded with extra ammo or better health. That's deranged, even for id.

Still, this game is clearly an action fan's dream. If you don't mind the gore and can wait for better multiplayer support, Quake II should be on your must-own list.—Michael E. Ryan



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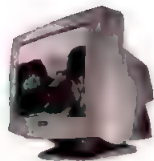
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After Hours

Hoop Dreams

It's up to you: Shoot the three, drive the lane, or go up for the reverse lay-up.

The exciting careers—not to mention the high profile and high salaries—enjoyed by NBA players like Jordan, Malone, and Hill inspire many dreams of landing big-time professional basketball contracts. But although few of us will ever play in front of a nationwide TV audience, we can play alongside the NBA elite on a PC.

NBA Action 98

Before he became the NBA's version of God, even Michael Jordan was an unrefined rookie, albeit a rookie who showed some serious potential. The same holds true for NBA Action 98. It's as unpolished as a rookie, but it still manages to show the veteran NBA Live a new move or two. The title is concerned more with the basics of b-ball than getting Dennis Rodman's hair the correct shade of green. The game, however, does sport plenty of detail when it comes to player movements and mannerisms.

What really sets this Windows 95 game apart is the outstanding artificial intelligence. Running on a Pentium/90 with at least 16MB of RAM, the game makes use of the clock as well as the court. Players controlled by the computer will drive the open lane, set up and utilize picks, and even

take advantage of the shot clock during the closing seconds of a close contest. Another big plus for this game is the way controller input responds instantly, making multiple-button maneuvers an acquired skill and not a matter of happenstance. The game seems to know what you're trying to do instead of what your fumbling fingers erroneously dictate.

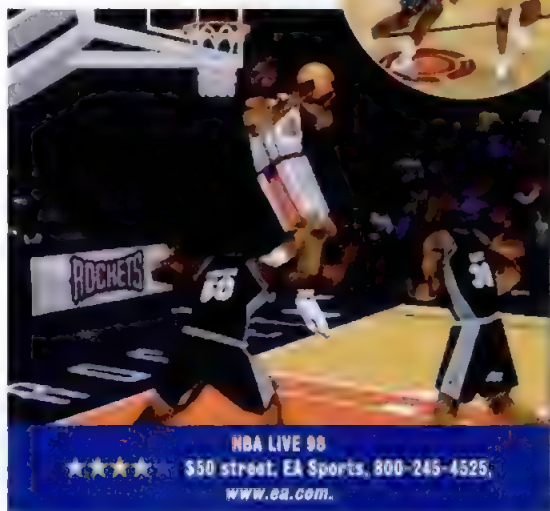
There are plenty of effects here, however, that could use some elbow grease to bring up the polish. For example, you have to look long and hard (it helps to squint a little) to notice that you're playing on hardwood floors. In addition, the background shots are



pretty generic, consisting of flat pixels instead of a realistic-looking crowd, and the play-by-play, peppered with cheesy generic phrases, was more of a

distraction than an enhancement.

Nevertheless, if you're more interested in the fundamentals of basketball than slick arena designs, Action 98 is the up-and-comer that you'll be shooting for.



NBA Live 98

Today's NBA is all about smilin', stylin', and profilin' in hopes of making it on ESPN's "Play of the Day," and NBA Live 98's got the goods in the good-looks department, with players who actually look like the NBA players.

Thanks to the high technology that a 3Dfx card gives you, EA Sports has been able to produce some impressive effects, not only with the players but with the court as well. There are incredible shadow effects, and you can actually see the ball spin when it's bounced, all at an excellent frame rate.

And while great graphics may sound like all you need,

what would hoops be without great sound? Not to worry—EA Sports has thought of that, too. You get the squeaking of sneakers, the smack of bodies on the floor, the crashing of the backboards, and the swoosh of the net, as well as a great play-by-play that rarely misses the mark.

Great graphics and sound require a system with some muscle. While the minimum system requirements are a Pentium/100 with 16MB of RAM, for good performance you'll need a Pentium/166 with 32MB of RAM and a 3-D accelerator for 3Dfx.

So much for the bells and whistles. Many complain that today's NBA is lacking in fundamentals, and true to its real-life counterpart, NBA Live 98 is lacking in a few fundamentals as well, namely: "Where's the D?" It's all too easy to score against computerized or human components with no incentive for true team play, and it's just as easy to break through triple coverage and drive the ball in for two as it is to pass to an open teammate. The result: games with ridiculously high scores.

The interface takes a bit of getting used to before you can behind-the-back with the best of them. Still, the flaws are buried beneath the beauty of it all. While kids from coast to coast dream about growing up to "be like Mike," NBA Live 98 is still the only title that really gives you a chance to live out your hoop dreams.—Shane Mooney

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After Hours

The Civil War Revisited

Don your Yankee blues or Confederate grays in this engaging strategy game.

Getting a bit battle-weary revisiting the conflicts featured in Sierra On-Line's Robert E. Lee, Civil War General? Then grab your canteen and Smith & Wesson and load up Civil War Generals 2.

Where last year's game focused on the legendary Lee and his battles, this time around you can play as a Confederate or Union general (like Grant or Sherman for the North or Lee for the South) at Vicksburg, Fredericksburg, or dozens of other sites.

Civil War 2 expands on its predecessor with a number of features that add to the historical accuracy of the simulation, including new unit types such

as horse artillery.

Except for the ability to choose the side you'll fight for, game play doesn't differ markedly from the Robert E. Lee edition. You can play one battle as a single game or play a full campaign that consists of a series of linked battles. You can set the difficulty level and select options such as a full view of the field or a line-of-fire sight.

As in the original, in this game you must use actual strategies and tactics

used during the Civil War, such as engaging in hand-to-hand combat. Icons at the bottom of the screen clue you in to the level of your supplies, casualties you've suffered, and other items vital to success.

Well-rendered graphics with overhead and zoom views and period music combine to en-

hance your enjoyment of the action. Reenactment footage also adds to the excitement of play. We liked the Civil War History Supplement, a nicely crafted feature that uses audio and video clips to introduce newcomers to the war, the central figures of the day, and the conflict's causes.

You can pit your skills against the computer or a buddy on the same PC (in multiplayer mode) or battle other players via a network or Internet connection. We relished playing Civil War Generals 2. Whenever the screen showed the message "We've caught them with their britches down; have at them, boys!", we did.—*Bertrand C. Emmett*



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Java Applications and Environments

We survey the market for early applications written in Java. Where do they fit in an already crowded applications market? And who has the best Java virtual machine? Do apps run true in each? We report the results of our compatibility testing.

Java Applet Tools

One of the more popular uses of Java right now is for creating little interactive applets to liven up Web pages. We review applet creation tools easy enough for most users to tackle.

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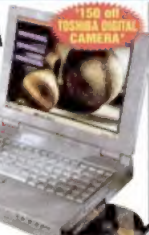
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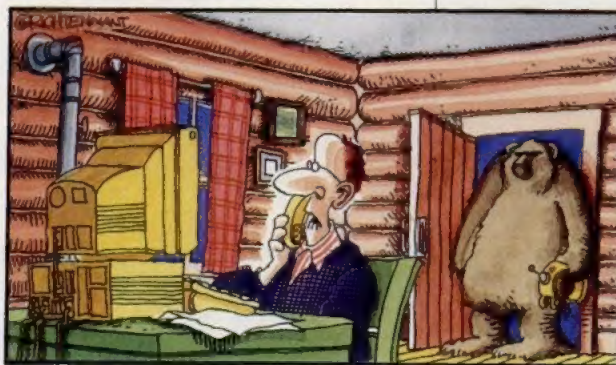
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